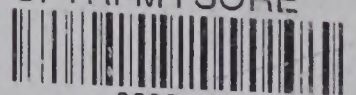


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THE CLINICAL APPROACH IN MEDICAL PRACTICE

By

G. E. BEAUMONT

M.A., D.M., F.R.C.P., D.P.H.

*Hon. Consultant Physician to The Middlesex Hospital, London,
and to The Hospital for Diseases of the
Chest, Brompton, London.*

With 74 Illustrations



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*“Look not for Whales in the Euxine Sea, or expect
great matters where they are not to be found.”*

CHRISTIAN MORALS

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PREFACE

THIS book is written on lines similar to my "Applied Medicine," to which it forms a companion volume. In addition to the section dealing with the Descriptive Cases and the accounts of clinical ward teaching related in the Question and Answer series, I have included a new feature. Part II is devoted to a consideration of two subjects, "The Trials of the Tuberculous" and "Resuscitation in Congestive Heart Failure," both being illustrated by a group of cases.

In this section I have endeavoured to show the reactions of the patient to tuberculosis and heart failure, and to appraise the value of the modern methods of treatment. The description of pulmonary tuberculosis is based on my experience of over thirty years at the Brompton Chest Hospital and on my private practice. Particular attention has been paid to the mental reactions of the patient at various stages of the disease—on first realizing that he is a victim of tuberculosis, during treatment, and on return to work.

It is always difficult to discover what the patient is really feeling about his illness, his nurses and his doctors.

"There's no art
To find the mind's construction in the face."

The patients have generally been interested in my enquiries and have tried to give me a clear account of their reactions during their long illnesses. These descriptions are in the patient's own words.

In many of the cases described in Parts I and III emphasis has been laid on the processes involved in establishing the diagnosis, and on the appropriate treatment. Diagnosis is a fascinating intellectual exercise which is dependent on one's own skill, and a great thrill may be obtained by making a correct diagnosis in a difficult case.

The title chosen for this book stresses the importance of the clinical aspects in the examination of patients. There is a tendency at the present time for the emphasis in the practice of medicine to shift from the clinician to the technician, a tendency which, I think, is to be deplored. Investigations by laboratory and X-ray examinations are of the greatest importance, but they should always be ancillary to the clinical examination and carried out for a definite purpose.

Once again I am indebted to my friend, Mr. Archer Ryland, for reading large sections of the book, and for his valuable suggestions and criticisms. I have also much pleasure in thanking Dr. A. A. G.

Lewis for Fig. 16, Dr. W. Worms for Fig. 18, Mr. C. J. B. Murray and Miss E. D. Hewland for the diagram, Fig. 19, Dr. A. Thackray for the microphotograph of the kidney, Fig. 38, Dr. M. D. Culver Evans and Miss E. D. Hewland for Fig. 51, Dr. C. Markus for the diagrammatic map of the Frisches Haff, Fig. 60, and Dr. A. M. Jelliffe for Fig. 67, illustrating the right aortic arch and aberrant left subclavian artery.

I am very grateful to my wife for her advice on doubtful points. My secretary, Miss E. G. Smyth, has prepared the manuscript for the printer with her customary care and skill, and has made many very helpful suggestions in the choice of material. I am very grateful to Mr. T. J. Shields for the index, which forms such an important part of the book. Finally Messrs. J. & A. Churchill Ltd. have earned my thanks once more by their assistance and advice on many occasions, and I am much indebted to Mr. J. Rivers for the readiness with which he has placed his great experience at my disposal in the preparation of this volume.

G. E. BEAUMONT.

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Part I
DESCRIPTIVE CASES

“The first addresses of a physician to his patient should be gracious, gay, and pleasing; never did any ill-looking morose physician do anything to purpose.”

OF DIVERSION

HOW I ENTERED BASINGSTOKE ON A MILK TANKER

*“ So, we'll go no more a-roving
So late into the night.”*

EARLY in the summer of 1947 I was asked by a chest specialist in London if I would go with him to see a patient in the West of England, in consultation with his general practitioner.

The case was urgent, necessitating our setting forth the same evening, and, as we should not reach home until the early hours of the morning, we decided to travel in comfort in a large hired car. Although we each possessed a smaller car of the same make, we were chauffeurless, and so we planned to sleep in the hired car on the way home.

Leaving London at 5.45 in the evening, we dined on the way, and arrived at our destination three and a half hours later, having covered the 115 miles at an average speed of thirty-eight miles per hour. On the way down my friend gave me some details of the patient's history. He was a young man, and indeed this was his twenty-sixth birthday. Twice he had suffered from bronchopneumonia, and at the age of fourteen he had been examined by a chest specialist, when no signs of tuberculosis were found. In the spring of this year the patient was examined by another chest specialist, and was again given a clean bill of health. The reason for this examination was that his father was a sufferer from chronic pulmonary tuberculosis, and was leading now a semi-invalid life, and further, our patient was due to be married in two weeks' time.

Five weeks before our visit the young man, who had previously been very fit and was in one of the Services, noticed a feeling of extreme lassitude. Two weeks later his temperature suddenly rose to 103° and 104° F., and the local practitioner found signs suggesting consolidation at the top of the right lung. My friend then paid him a visit and confirmed the signs of consolidation. A very small amount of sputum was brought up on one occasion, which was found to contain a few tubercle bacilli on direct film examination.

For the next three weeks the temperature chart showed a continuous pyrexia, ranging from 102° F. in the morning to 104° F. in the evening. For the last two days, however, the temperature had changed to a remittent type, dropping to 99° F. in the morning and rising to about 101° F. in the evening. During this time the patient had been treated first with sulphonamides and later with penicillin, but with no beneficial result.

It was still light when we arrived at our destination, a large country house, situated in extensive and beautifully laid out grounds. We were

met by the general practitioner and at once went upstairs to see the patient. He was a big man, over six feet in height, well developed, but had been rapidly losing weight during the past few weeks. I found him lying in bed, a hectic flush on his cheek, lank moist hair, a sweat upon his brow, and eyes staring brightly. As I looked at him there passed through my mind Sir Thomas Browne's words on a similar occasion, and it seemed that "he was not like to behold a Grashopper, much less to pluck another Fig."

The physical signs in the chest were clearly defined, dullness over the upper half of the right lung, with weak breath sounds and numerous râles. At the apex of the lung behind there was a small area of bronchial breathing, with bubbling râles and whispering pectoriloquy. I concluded that caseation was taking place at this spot, and that this accounted for the change in the temperature chart, from the continuous to the remittent type. There could be no doubt that he was suffering from what used to be called "galloping consumption," with its dread prognosis.

We now returned to the drawing-room for the consultation where we found assembled the patient's father, subdued and quiet, the mother, domineering and talkative, and the fiancée, a much interested spectator. We discussed the advisability of administering streptomycin, which was at that time undergoing clinical trials in England, and was not yet available for general use. I had tried it on some chronic cases of pulmonary tuberculosis in hospital without any striking effects, but it was said to produce its most beneficial results in the acute type of disease, such as we were now dealing with. The family had already obtained a supply of streptomycin, but had hesitated to use it for fear of some harmful effect. I had no hesitation, however, in advising that the streptomycin should be used in this case, as it was clear that the disease was making rapid progress and that the chance of recovery was otherwise slight.

We were now offered light refreshments with champagne, and, before leaving, our hosts insisted that we should see the grounds in the glory of the fading evening light. The lilac and the rhododendrons were particularly beautiful, faintly gleaming against the dark background of the rolling lawns.

Leaving for home at 10.30 p.m. we settled down for a quick run back and a peaceful sleep. After covering about twenty miles I noticed the engine was misfiring from time to time, and soon we came to a standstill. The chauffeur got out and opened the tool box, only to find it bare. There was not even the means of changing a wheel, supposing we had a puncture. After a pause we moved on again and then kept stopping and starting, only being able to crawl up the slightest incline, and eventually we stopped altogether. It was clear that the

trouble was due to a fault in the petrol supply, probably due to air emboli. Having had exactly similar trouble in my car a few weeks before I knew it was due to a fault in the autovac, but the chauffeur did not appear to think very highly of my diagnostic powers. Eventually he borrowed a spanner from a passing lorry, disconnected the petrol pipe from the carburetter, and, by letting the petrol run through, cleared away the bubbles of air. We started again but soon the trouble recurred, and eventually, seven miles from Basingstoke, the car stopped finally, refusing all the chauffeur's blandishments, and we were stranded by the roadside. So much for our luxurious drive home! However, it was a lovely summer night, very warm, with the inconstant moon still shining brightly overhead. We sat by the roadside hoping for a car to come. Soon we heard a rumble in the distance, and round the bend a milk tanker appeared, travelling slowly towards us. It was not one of the modern type, with large resilient pneumatic tyres, but old-fashioned, with solid wheels. We hailed it, and the driver said he would take us to Basingstoke, which was the end of his journey; so climbing into the wooden cab, we sat cramped together. Jolting along we arrived in the centre of Basingstoke at 1.15 a.m. The town appeared completely deserted, and the driver advised us to walk to the station, a mile away, and see if there was a night train back to London.

My friend was a very nice fellow, but from my point of view he had one great disadvantage. He possessed very long legs, and mine are short. Further, he seemed in a great hurry to reach that station, and so I had to trot along by his side carrying a heavy bag and a light overcoat.

On arriving at the station we found that a slow train to London was expected at 2.18 a.m. This did not suit my friend, but I felt too exhausted to make any further efforts and said I would rest there. Back to the centre of Basingstoke hurried my friend, to call at the police station and ask if they could help us to get a car home. In about half an hour he returned and said the police had ordered a car to come to the station to pick us up. Two o'clock came and no car, two-fifteen and still no car. We decided now that we must not miss the train, so went across the bridge to the up platform. At 2.18 we were there waiting for the train—no train was in sight, so back once more went my friend to see if the car had arrived. It was there, and just as the train came in I was fetched back, over the bridge and down to the car. The driver, a young man, appeared half asleep, with tousled hair and indoor slippers, and the car possessed none of the magnificence of the one we had left by the roadside. It was small and shabby, but it went and we arrived safely in London at 4 a.m.

The subsequent course of the case was interesting. Streptomycin was given and the patient's temperature fell to normal in two weeks.

Two further sputum tests were made in London. The first showed no tubercle bacilli; in the film from the second specimen one tubercle bacillus was found. The streptomycin was probably discontinued too soon, for about six weeks later the temperature recurred and the patient was moved to a nursing home in London. The sputum now contained many tubercle bacilli and the X-ray showed a cavity in the right upper lobe, where the signs of caseation had previously been noted. An artificial pneumothorax was established, a good collapse obtained, the disease was completely controlled, and six months later the patient left this country to complete his treatment in Switzerland.

PAIN IN THE HIP

“ And hov’ring death prepared the blow.”

ON THE DEATH OF MR. ROBERT LEVET

EARLY one October I was asked to see a patient who had been admitted to hospital on account of pain in the region of the left hip. Mr. A. was a married man, forty-nine years of age, engaged in commerce, who had previously enjoyed good health, except for an attack of left-sided renal colic two years ago. About a year later, in the summer, he began to feel tired towards the end of the day, and gradually lost about one stone in weight. Three months before I saw him, the patient consulted his general practitioner on account of swellings on the point of each elbow, when a diagnosis was made of “painless bursitis.” A month later what seemed to be the first symptom of his present illness was noticed, a slight pain in the left knee which made him limp. The left leg felt weak after walking, and there was pain in the knee on getting in and out of a car. He now went away for a holiday but still continued to limp, although able to swim quite normally. On returning home in the middle of August he woke one morning with severe pain in the front of the left thigh, and slight pain extending down the left shin. The pain continued relentlessly, being worse at night and preventing sleep, as is so often the case with neuritis. Some relief was obtained by sitting with the left leg crossed over the right, and about this time a slight wasting of the muscles of the left thigh was first noticed.

His doctor now decided to seek further advice, and first arranged for an X-ray examination of the left hip and knee. The knee was said to be radiologically normal, the hip showed early osteo-arthritic changes, but no other evidence of bone disease (see Fig. 1). The first of the long line of consultants who were to become interested in this case was now called in, and, as a result, a course of physiotherapy was given, but unfortunately without relief. The treatment appeared to aggravate the neuritic pain. The general practitioner next sought the opinion of a physician who advised admitting the patient to hospital for more complete investigation. Here he was examined by two neurologists. It was now found for the first time that the patient was febrile, the temperature usually being 99.2° F. in the morning, and 99.8° – 100° F. in the evening. The results of the tests were as follows: X-ray of chest: Normal. X-ray of spine: There is a moderate degree of kyphosis in the upper thoracic region, with a little associated wedging of Th. 5. Intravenous pyelogram: Small opacity present in left renal

area, below the tip of the twelfth rib. It is present in all films and is not like a calculus or renal abnormality. Minor dilatation of left renal pelvis. ? non-specific pyelo-nephritis. *Barium enema*: Normal. *Blood culture*: Sterile. *Blood Wassermann and Kahn reactions*: Negative. *Urine*: Acid. No albumin. No sugar. Deposit, calcium oxalate crystals, no casts or organisms. *Blood count*: Red cells 4.6 millions per c.mm., Hb. 84 per cent, C.I. 0.9, white cells 10,600 per c.mm.,



FIG. 1. First X-ray of left hip.

polymorphs. 77 per cent, lymphocytes 16 per cent, monocytes 5 per cent, eosinophils 2 per cent. *Sedimentation rate of red cells*: 94 mm./1 hr. (Westergren). *Alkaline phosphatase* 45 units (King-Armstrong)/100 c.c. *Acid phosphatase*: Normal. *Plasma proteins*: 7.5 G., albumin 3.7 G., globulin 2.9 G., fibrinogen 0.9 G. per cent. *Cerebro-spinal fluid*: Clear. Pressure normal. Protein 65 mg./100 c.c. Globulin +. Cells 4 lymphocytes per c.mm. No bacteria. *Liver function tests*: Thymol turbidity 1 unit. Colloidal gold + 1 unit. Serum bilirubin 0.4 mg./100 c.c.

The most striking results of these investigations were the high

sedimentation rate of the red cells, and the high alkaline phosphatase content of the blood. The oxaluria offered a cause for the previous attack of renal colic.

The second neurologist reported that he found 2 in. wasting of the left quadriceps muscle. Voluntary hip flexion was limited by pain. The knee-jerks and ankle-jerks were present, and the plantar responses were flexor. Rectal examination showed no abnormality. He added, "I should diagnose the condition as one of prolapse of the L.3-4 intervertebral disc, were it not for the general ill-health, loss of weight and high sedimentation rate. These strongly suggest malignant disease, and the patient may well have a metastasis. No further investigations except a myelogram are indicated."

The patient was now moved to another hospital where I first saw him early in October. Some further investigations had been carried out. *Dental radiogram*: A large abscess was shown in the lower jaw on the left side at the roots of 5 and 6 teeth. *Myelogram*: Cerebro-spinal fluid pressure 110 mm. Free rise and fall. Protein 35 mg./100 c.c. No excess of globulin by Pandy test. No evidence of cord tumour or of prolapsed disc. *Urine amino acids*: 120 mg./100 c.c. (normal). *X-rays of skeleton*: A fresh series was taken which showed no abnormality in the ribs, vertebræ, pelvis or hips. *X-ray of sinuses*: Polypi in floor of left and right antra. Frontal and ethmoidal sinuses normal. *Alkaline phosphatase*: 27.1 King-Armstrong units per 100 c.c.

A week later the alkaline phosphatase had risen further to 50 units per c.c. The sedimentation rate of the red cells was also higher, 120 mm. at one hour (Westergren).

I first saw the patient, as I said before, in the beginning of October. Throughout the illness his chief characteristics were listlessness and apathy. He hardly ever spoke, except in answer to a question, and then only very briefly. He lay in bed taking little interest in his surroundings, neither reading nor listening to the wireless, and seldom talking to his visitors. In the early stages he did not look ill, his complexion being pink and body well nourished.

His wife was small, alert and naturally very anxious. She was clearly determined to do all in her power, by asking for further opinions, to elucidate the nature of her husband's illness. By doing this, before the physician in charge of the case had time to know the results of the examinations he had asked for, she tended to antagonize him and to create the impression that she lacked confidence. But we have all suffered in this respect!

Apart from the 2 in. wasting of the left thigh, and $\frac{3}{4}$ in. of the left calf, I could find no abnormal signs elsewhere. There was now no evidence of the bursitis of the elbows which the general practitioner had noted earlier. The neurologist watched me make my examination

and expressed the opinion that if the pain and wasting of the leg were due to a bony lesion, the eighth thoracic vertebra would be the one affected; if, however, the lesion were in the cord it would be located in the cauda equina.

The general practitioner was short, rotund, pink-faced, and middle-aged. He believed in calling in as many specialists as the relatives desired, without necessarily informing the physician who was in charge of the patient in hospital. In discussing the case with me he frequently referred to the results of the pathological investigations, and appeared not to appreciate the difference between the alkali reserve and the alkaline phosphatase. He would say to me "Why is the alkali reserve so high?" and I would reply "the alkaline phosphatase."

I suggested that possibly the condition was one of polyarteritis nodosa, in which disease neuritis multiplex may occur. If that were so the nerve lesion at the present time would be a mono-neuritis. Alternatively I proposed that the patient was suffering from radiculitis, not due to a vertebral or meningeal lesion. The difficulty was to explain the general ill-health of the patient, the fever, the high red cell sedimentation rate and the raised serum alkaline phosphatase content. The ill-health, fever, sedimentation rate and the neuritis might perhaps be due to the large root abscess in the lower jaw, but this would not account for the high alkaline phosphatase figure.

My advice was that the two affected teeth should be removed under penicillin cover, and this was done a day or so later. I also asked for further investigations to try and discover the cause of the alkaline phosphatase reading. I made a list of the conditions associated with a high alkaline phosphatase:—liver disorders, especially obstructive jaundice and carcinoma of the liver, some varieties of cirrhosis, Paget's disease, rickets, hyperparathyroidism, osteomalacia, idiopathic steatorrhœa, osteogenic sarcoma, carcinoma of bone, and renal tubular acidosis. I asked, therefore, for the serum calcium content, the test for Bence Jones protein in the urine, the determination of the fat content of the fæces, the estimation of the alkali reserve and the serum phosphate and potassium.

Serum calcium: 10·6 mg./100 c.c. *Urine:* No Bence Jones protein. *Alkali reserve* (plasma): 27 mEq./l (normal 24–32). *Plasma phosphate:* 3·1 mg./100 c.c. (normal). *Serum potassium:* 5 mEq./l (normal). *Serum sodium:* 136 mEq./l (normal). *Acid phosphatase:* 0·8 King-Armstrong units/100 c.c. *Fat in fæces:* Total fat, 11·6 per cent of dried fæces. Unsplit fat, 2·3 per cent. Split fat, 9·3 per cent. Fæces appear normal microscopically.

From these tests and those previously done it appeared possible to exclude liver disorders, except carcinoma. The liver was not palpable, there was no jaundice, no spider nævi had been found in the skin, and

the liver function tests were normal. The X-ray examination of the bones appeared to exclude Paget's disease, rickets, sarcoma, carcinoma, osteomalacia and hyperparathyroidism. The normal serum calcium content was also opposed to a diagnosis of hyperparathyroidism. The normal fat content of the faeces excluded idiopathic steatorrhœa, and, finally, the normal alkali reserve, serum phosphate and potassium rendered a diagnosis of renal tubular acidosis highly improbable.

After the removal of the two affected teeth there was no improvement in the patient's condition, no fall in temperature, and no lowering of the red cell sedimentation rate. A streptococcus viridans was grown from the dental root abscess. Further careful examination of the muscles and subcutaneous tissues failed to reveal any nodules suggestive of polyarteritis nodosa. The high sedimentation rate and alkaline phosphatase figure, together with the slow but steady deterioration of the patient's general condition and the increasing weakness and wasting of the left leg, all suggested malignant disease, but where was it situated?

A week later, at the wife's request, another consulting physician was called in. The sedimentation rate of the red cells was now 125 mm. at one hour (Westergren). The temperature was a little lower, reaching only 99° F. in the evening, and the patient's chief complaint was weakness and loss of appetite. The pain in the hip was less severe. After his examination the physician remarked that he was impressed by the abdominal distension, the abdomen appearing fatter than the rest of the body would warrant. Although the liver was not palpable, he expressed the opinion that it might be enlarged and the seat of cancer. The pain in the leg might result from pressure of an enlarged gland on the lumbar nerves. He suggested that a fractional test meal and a barium meal examination should be carried out, to see if they showed any evidence of a primary growth in the stomach. These tests were made, with normal results.

The wife was naturally very depressed by this view, as she had been buoyed up by the hope that the illness was due to a "germ," connected with the abscess at the roots of the teeth.

During the following week there was very little change in the patient's clinical condition. I succeeded in improving his appetite by scraping the thick yellow fur from his tongue and by prescribing pineapple juice, so much so that he was able to eat and enjoy a four course hospital dinner. There was now practically no pain in the hip or leg, but the weakness and wasting remained unchanged. During this time aureomycin was given for a week, without any lowering of the temperature, which varied between 99° and 100° F. at night. There was no cough, no respiratory symptoms, no sweating, and no jaundice. At the end of this week I examined the abdomen again. It was still distended and difficult to examine but on two occasions I felt quite

definitely an enlarged, firm and irregular liver. A mass was palpable 3–4 in. below the right costal region in the mid-clavicular line. I could not feel the spleen or the kidneys. I decided now that a liver puncture should be carried out, in order to try to prove or exclude the presence of carcinoma of the liver. This was done, and the physician who performed the operation considered that the high alkaline phosphatase and the absence of jaundice favoured the diagnosis of carcinoma of the liver, and that the neuropathy might be due to a carcinoma toxæmia. Against the view that the pain was due to a gland pressing on the lumbar plexus was the probability that it would have become more severe, whereas it was diminishing in intensity.

The liver biopsy showed no evidence of carcinoma or of cirrhosis, but plasma cells were seen adjacent to the bile ducts, suggesting the possibility of myelomatosis, and the physician who performed the puncture advised that the bone marrow should now be examined to exclude this diagnosis. When I rang up the general practitioner to tell him this, he answered, "Poor fellow, not this week-end."

Towards the end of the month Mr. A. was examined again by the neurologist, who now found slight limitation of adduction and external rotation of the left hip. There was also slight weakness of hip and knee flexion on the right side. The patient was looking more ill, the face was thin and sallow and had lost its pink tinge. The temperature was also higher, 100° to 101° F. in the evening. The neurologist suggested the possibility of a small primary growth in an adrenal or in the lungs, with secondary deposits in the liver and pelvic glands. The uncertainty of the diagnosis was now becoming more and more distressing to the relatives and to the doctors, and we decided to have a fresh series of X-rays of the bones to see if any changes had taken place. The skull appeared quite normal, but the report on the X-ray of the pelvis was as follows: "There is an area of decalcification and bone erosion in the lesser trochanter of the left femur, and of the inner part of the neck of the femur. The appearances might be due to a primary sarcoma, or to a secondary deposit, possibly from a hypernephroma." The blood-count was also repeated: Red cells 3·4 millions per c.mm., Hb. 55 per cent, C.I. 0·86, white cells 12,500 per c.mm., polymorphs. 71 per cent, lymphocytes 20 per cent, monocytes 8 per cent, eosinophils 1 per cent.

On looking back at the X-ray films of the pyelogram, taken a month earlier, it was seen that the lesser trochanter of the left femur was very slightly eroded, although this had not been previously noticed (see Fig. 1). Further, the shadow of the left kidney did not appear to be quite normal. The only possible site for the primary growth therefore appeared to be in the left kidney.

The relatives were now becoming even more restless and anxious,

and asked me, "What is the matter? What treatment is being given?"

Three days later the neurologist, the general practitioner and I met again in consultation. Further X-rays had in the meantime been taken of the upper end of the left femur with increased penetration. The lesser trochanter had now almost completely disappeared (see Fig. 2). In addition, an area of erosion was seen in the centre of the acetabulum, involving also the head of the femur, about the size of a sixpence.



FIG. 2. X-ray of left hip taken two months after Fig. 1. The lesser trochanter of the femur is now almost completely eroded.

The neurologist considered that there was probably a large mass in the pelvis pressing on the lumbo-sacral plexus, for the actual bony lesion which had been revealed in the radiograms could not cause the pain and wasting. Only very small glands could be felt in the left groin. The abdomen was still distended, rather tense but not rigid, and again I felt the firm mass which I considered to be in the liver. There was no ascites and I could not feel the left kidney. We decided to call in an orthopaedic surgeon to see whether, from his experience of

bone tumours, he could throw any further light on the case. When I told Mrs. A. this she was very distressed, saying "The X-rays were taken three days ago. Why did you not call in an orthopædic surgeon sooner?" The wife wanted one orthopædic surgeon to be consulted, her brother suggested another, and I left it to the general practitioner to decide. It was not until 11 p.m. that an orthopædic surgeon could be obtained. When, however, he did come he made a very important observation which cast fresh light on the problem and which suggested a method of establishing the diagnosis. He considered that the bony lesion was probably secondary, as there was no evidence of new bone formation. Further, he said there was no X-ray evidence of erosion of the acetabulum or of the head of the femur, the appearances being compatible with the normal. He noted, however, what had previously been overlooked, a swelling both visible and palpable, in the left thigh, just below Poupert's ligament. We do not know how long it had been present, but probably not for more than a few days, as it was not noted when the neurologist made a very careful examination about a week earlier. The swelling measured 3 in. by 2 in. It was firm, with a smooth surface and no pulsation was detected. It was presumably part of the mass which had eroded the lesser trochanter, and the next step was clearly a biopsy. I then told Mrs. A. that we advised an operation to remove a small portion of the mass for examination under the microscope. "To confirm the diagnosis," Mrs. A. intervened. "No, to try to determine it," I replied. I was left to explain to the patient what was happening and I told him that there was now a swelling in the thigh, which meant that things were coming to a head near the bad hip, and by taking out a piece of the swelling we should be able to decide the cause of the trouble. I asked "Are you willing to have this done?" He did not reply, but the wife answered "What you say, goes." My house physician's comment on this prolonged series of examinations was, "I think the reason why it has taken so long to come to a diagnosis is that so many specialists have been called in," to which I replied:

"And differing judgments serve but to declare
That Truth lies somewhere, if we know but where."

The diagnosis, however, was not established by the biopsy. The surgeon explored the thigh. On incising the skin and subcutaneous tissues, and pulling the rectus femoris muscle outwards, a swelling was seen, bluish in colour, about the size of a squashed-out tangerine. On incision it bled freely, the bleeding being *arterial*. The tumour encircled the neck of the femur. The swelling found on clinical examination was due to the pushing forwards of the muscle and soft tissues by the tumour. The bleeding was so severe that a transfusion was required.

The surgeon considered that the tumour might be a vascular sarcoma, and said that these very vascular tumours undergo necrosis and give rise to fever. This diagnosis appeared to explain the whole clinical picture, the erosion of bone, the pressure on nerves, and the enlargement of the liver due to a secondary deposit there.

The report on the biopsy material, both of the tumour and of a portion of the eroded bone, which was received the next day, only increased our confusion. It read as follows: "The tissue shows blood clot and angioma. There is no evidence of malignant growth. The bone shows changes of decalcification." This was totally opposed to the clinical findings, and it seemed unlikely that a simple angioma could erode bone.

I was interested in the surgeon emphasizing the arterial nature of the bleeding, for this is always of sinister significance.

You will remember Charles Brown's description of how Keats was severely chilled coming from London to Hampstead outside the stage coach on the bitter night of February 3rd, 1820. He went to bed and "On entering the cold sheets, before his head was on the pillow, he slightly coughed, and I heard him say, 'That is blood from my mouth.' I went towards him; he was examining a single drop of blood upon the sheet. 'Bring me the candle, Brown, and let me see this blood.' After regarding it steadfastly he looked up in my face, with a calmness of countenance that I can never forget, and said,—'I know the colour of that blood;—it is arterial blood;—I cannot be deceived in that colour;—that drop of blood is my death warrant;—I must die.' "

On February 23rd, 1821, Keats died after recurrent hæmorrhages. His last recorded words were to his faithful friend, Joseph Severn, who devotedly nursed him until the end, "Severn—I—lift me up—I am dying—I shall die easy; don't be frightened—be firm, and thank God it has come."

But to resume, our next step was to call in a radiotherapist to see if he considered that deep X-ray treatment should be given to the hip. The latest blood film had shown the presence of an occasional myelocyte, and in view of this and of the finding of myelocytes in the liver biopsy, the radiotherapist urged that a marrow puncture should be made before commencing X-ray treatment. We decided therefore to give the patient a general anæsthetic and perform an aortogram, left femoral arteriogram and marrow puncture. The bone-marrow showed an increase in the number of plasma cells, which numbered 11 per cent, as against a normal reading of 0-1 per cent. This favoured a diagnosis of myelomatosis. In addition the hæmatologist found "fairly large clumps of unidentified cells of unknown origin and significance," and so the diagnosis still remained uncertain. The aortogram revealed "a large tumour in the lower pole of the left kidney, almost certainly a

hypernephroma" (see Fig. 3). A vascular tumour was also seen radiologically surrounding the neck and head of the femur (see Fig. 4). No vascular tumour was seen in the pelvis. Another radiologist examined the films and was convinced that the condition was one of hypernephroma, as he could see areas of calcification in the enlarged kidney shadow. The bone-marrow film was also shown to another

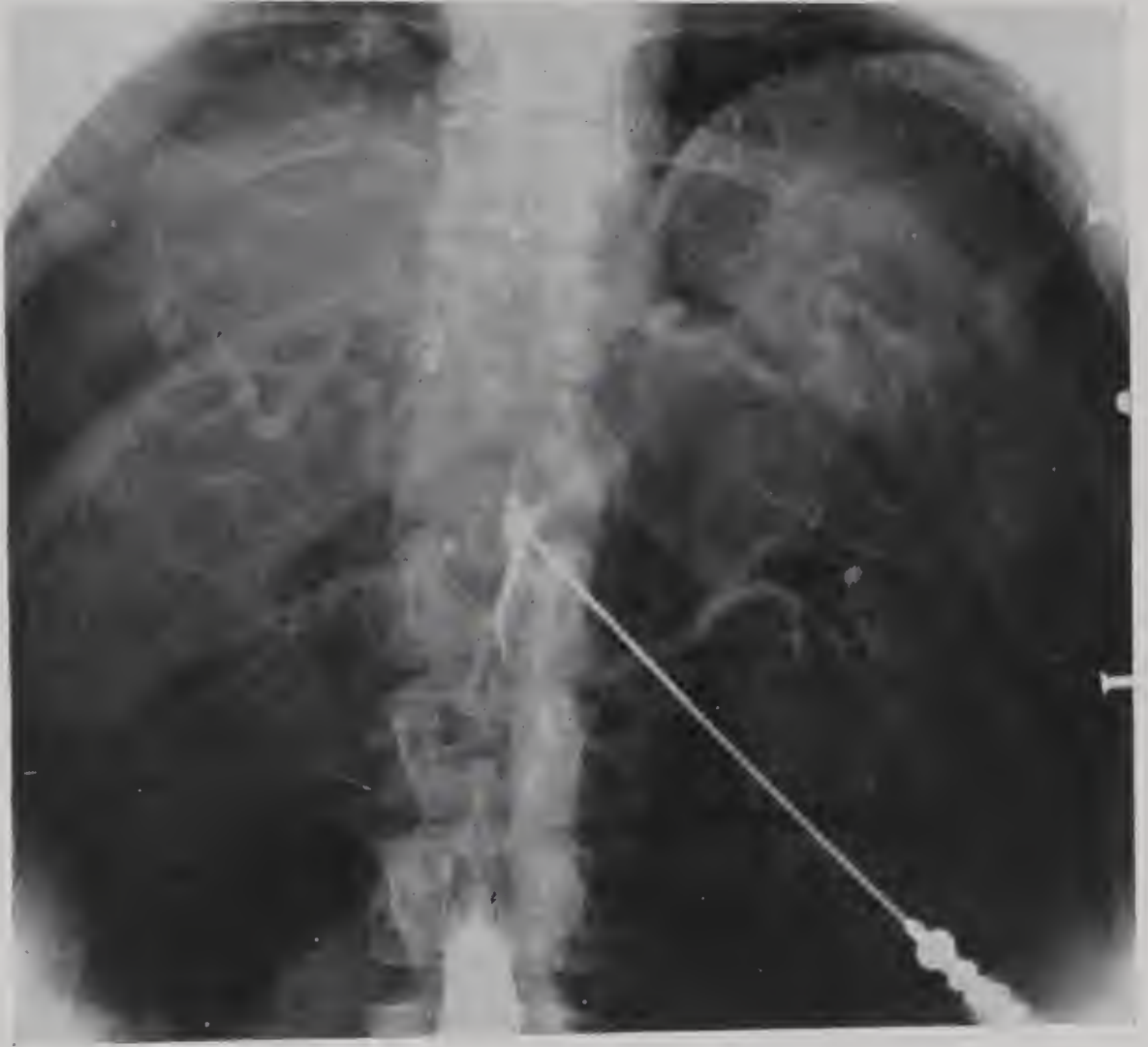


FIG. 3. Aortogram. The left renal shadow is enlarged. A mass of tortuous arteries is seen in the lower pole. Lipiodol is present as the result of the previous myelogram.

haematologist who reported "I have no doubt that the groups of cells present in the bone-marrow are a secondary growth. The site of the primary I would not venture to designate as these cells are most varied in appearance. I do feel, however, that their distribution is such that no other diagnosis can be entertained."

There seemed now little doubt that at long last, and by a devious route, we had arrived at the correct diagnosis, primary hypernephroma of the left kidney, with secondary involvement of the liver and of the

hip, and so it was decided to begin a course of deep X-ray treatment to the hip. The patient was told that the treatment was for glands in the groin and as a friend of his had been given similar treatment and had made a good recovery, he was well satisfied. The friend had been a patient of mine, and had been treated for Hodgkin's disease.

There was definite improvement after nine X-ray treatments to the hip. The patient could now raise his left leg while lying in bed, which



FIG. 4. Arteriogram. A mass of tortuous arteries is shown around the neck of the femur.

he had not been able to do for some weeks. He was rather more cheerful, and once I succeeded in making him laugh.

And now a consultation took place without my knowledge. It was arranged at the week-end and I was only informed of it afterwards by my house physician. A radiotherapist was called in, who was on the staff of another hospital. When I asked the general practitioner what Mr. — thought about the patient he did appear somewhat confused, and avoided the issue by saying "As he has a cancerous growth he has a perfect right to see whom he likes." I quite agreed,

but mentioned the fact that I had been asked to take charge of the patient while he was in hospital. My house physician also told me that there was now much talk of taking the patient to America for further opinions.

When the course of twenty-two X-ray treatments was completed the patient looked considerably better, his eyes were clear and bright



FIG. 5. X-ray of hip. Calcification of lesser trochanter and neck of femur after deep X-ray treatment.

and cheeks once more pink. There was also complete relief from the pain in the hip. The temperature, however, was still raised, and although there was no apparent anæmia the red cells only numbered 2·8 millions per c.mm., with Hb. 47 per cent. I could now for the first time feel an enlarged left kidney. An X-ray film of the hip showed considerable calcification in the neck of the femur (see Fig. 5).

Early in January it was decided to begin a course of X-ray treatment over the left kidney, but after six treatments this was abandoned as the patient was becoming rapidly weaker and more despondent.

On paying one of my visits about a week later I was surprised to find that a consultation was taking place, again without my knowledge, and this time with a surgeon. The wife and the general practitioner were there, and everyone was looking very glum as the surgeon had just announced his predatory intention to remove the patient's left kidney. This was particularly disturbing as up to now the patient did not know that anything was wrong with his kidney. After leaving the patient's room the surgeon remarked that before operating the lungs must be X-rayed again, as secondary lesions may appear very rapidly there in cases of hypernephroma. He also added that it was very probable that he would find the kidney inoperable, or that the liver was involved with secondary deposits, in which case he would "shut him up" again.

As a mass had been palpable in the liver for several weeks I wondered whether there was really any indication for a laparotomy or justification for mentioning it to the patient and relatives. As a matter of purely academic discussion it might have been admissible. When the others had left, Mrs. A. came to me and asked "Why did they not say it was a gland they wanted to remove?" I could not answer this but went back to see the patient again. I found him very depressed, and slowly, in short staccato sentences, he expressed his views. "I do not want to have an operation. I hope you will tell the surgeon not to do it. Why should I have a kidney removed? I have no pain and there is nothing wrong with my water. My leg has done so well with X-rays, it is wonderful. Why do they not go on with X-rays to my stomach?"

I told him I did not think it would be necessary to have an operation, and so it happened, for the new X-ray film of the chest showed shadows of secondary deposits in both lungs. The shadows were like little innocent snow flakes and yet they indicated that the disease was both inoperable and incurable.

A further course of X-ray treatment was, however, given to the left kidney, after which the patient looked and felt better, and was able to get out of bed, sit in a chair and walk across the room.

Three weeks later Mr. A. returned home, the wife's last comment to me being "If he had gone to America six months ago he would have been cured." A month later the end came with signs of pulmonary congestion and heart failure. On reviewing the history it seems probable that the earliest symptom occurred nearly three years previously, with the attack of left-sided renal colic, to which we paid so little attention. If this is so it would be well to remember that renal colic may be the first symptom of hypernephroma.

HEPATIC LOBECTOMY

IN November 1951 a man in the late thirties went to France for a holiday. On the first day of his trip, while in the train going from Calais to Paris, he noticed pains low down in the abdomen. A change in diet could not be incriminated, as when the pains began he had not eaten any food abroad.

The pains continued intermittently during his holiday, and, after returning to England, he consulted a doctor who told him they were due to wind. During 1952 and 1953 the patient was seen by various general practitioners and specialists, but no relief was obtained. A barium meal and barium enema examination in 1952 showed no abnormality, and eventually a consultant told him the symptoms were due to a psychosis. The general practitioner remained unconvinced and in December 1953 arranged for a consultation with me. The doctor told me that the patient's condition was causing him some anxiety in view of the loss in weight and anæmia. A recent blood count showed red cells 4·8 millions per c.mm., Hb.58 per cent, C.I. 0·6.

I examined Mr. N. shortly afterwards. He was still complaining of lower abdominal pains, which occurred two or three times a day, and were relieved by passing wind or by having the bowels opened. He had been constipated and found that purgatives intensified the pain, but lately the bowels were opened two or three times a day, without an aperient. During the last two years he had noticed at times bright blood in the motions, the last occasion being two months previously. His appetite was poor, and he had lost a stone in weight during the preceding two years. For a month he had noticed an aching pain in the penis on passing urine.

Despite the anæmia Mr. N.'s complexion was pink and he did not look ill. The pain complained of was situated well below the navel in each iliac region of the abdomen. I could feel nothing abnormal in the abdomen except that the liver was just palpable. The heart, lungs, and blood pressure were normal, the urine contained no sugar, but there was a trace of albumin.

On rectal examination I felt a hard mass high up on the left side, and I wrote to the doctor saying I thought the patient was suffering from carcinoma of the sigmoid and that I was arranging for him to come into hospital. He was admitted early in January 1954. Proctoscopy showed nothing abnormal, and on sigmoidoscopy to 17 cm. blood and mucus were seen, but no neoplasm. The sedimentation rate of the red cells was raised to 25 mm./1 hr. (Westergren). The report on the barium enema was as follows: "A constricting lesion is

seen in the sigmoid colon some 2 in. in length. The appearance suggests carcinoma coli" (see Fig. 6). An X-ray film of the lungs was normal, and the films of the skull revealed the presence of an ivory osteoma in the left parietal region.

On January 14th an operation was performed. The growth was found to be situated in the sigmoid. A hemicolectomy was carried out, with end-to-end anastomosis. The pathological examination of the portion of the bowel removed showed an adenocarcinoma of average grade of malignancy, with five lymphatic metastases close to the bowel.



FIG. 6. Barium enema showing constricting lesion of sigmoid colon.

At the operation a large solitary metastasis was found in the right lobe of the liver.

The patient did very well after the operation, and left hospital two and a half weeks later. In February he returned for a second operation to remove the growth in the liver. This difficult and hazardous procedure was successfully performed, the right lobe of the liver being resected. The portion of liver removed weighed 33 oz., and the growth in the liver measured $2 \times 3\frac{1}{2}$ in. (see Fig. 7). The neoplasm was umbilicated and abutted on the anterior and inferior surfaces of the liver. On section it was seen to be an adenocarcinoma. An X-ray film taken after the operation showed an air space below the right



FIG. 7. Right lobe of liver showing secondary carcinoma.



FIG. 8. X-ray of chest, showing an air space below the right diaphragm following removal of right lobe of liver.

diaphragm in the area formerly occupied by the right lobe of the liver (see Fig. 8).

The patient came back to hospital for review early in May 1954. He had made good progress and gained over a stone in weight since the first operation.

A SOLVED PROBLEM

“ It seems . . . to be one of those simple cases which are so extremely difficult.”

THE BOSCOMBE VALLEY MYSTERY

AT the end of September 1950 I was asked by a neurologist to take a patient into hospital to discover the cause of his ill-health. He was a man, seventy years of age, a solicitor, who had been in hospital a few weeks previously, when a provisional diagnosis of temporal arteritis or of polyarteritis nodosa was made. The neurologist wrote to me, “ You will see from my notes that we failed to appreciate the significance of the raised E.S.R. The patient has gone downhill remarkably since he left hospital. Such loss of weight seems to rule out polyarteritis nodosa and I fear he has cancer, but where? I shall be interested to hear your solution.”

This was all I knew about Mr. P. when I first saw him, as I had not yet read the neurologist's notes, but the case appeared to offer interesting possibilities. I sat comfortably in an arm-chair by the bedside and proceeded to extract the history, my house physician writing down the story and the answers to my questions.

Here are the main points. The patient had been quite well until about May 1950, although his partners told him they had noticed he had been lacking in vigour for about a year. Six months ago he went to Italy for a holiday and was perfectly well there. In the middle of June he drove his family to Cornwall for their holiday, a journey of about 300 miles. Next day, returning home by train, he noticed a headache. I asked, “ Are you subject to headaches ? ” and he replied that it was a new experience. In July he went by train to Cornwall and drove his family back. He was now in a “ shocking state,” with a very severe headache. The general practitioner who was consulted said that there must have been a streptococcal throat infection, followed by sinusitis. The pain extended from the temporal regions to the occiput. The sensations were those of a pressure in the temples, and shooting pains at the back of the head; hardly those we are accustomed to associate with cranial sinusitis. Inhalations of menthol, however, relieved to a certain extent the feeling of pressure.

An ear, nose and throat specialist was now consulted, but he found no evidence of sinusitis. The patient was then referred to a neurologist, when a diagnosis of cerebral arteriosclerosis was made, and a daily dose of Luminal prescribed. The neurologist told the patient that he was going away for a holiday the next day, and as the patient related

this he appeared very resentful that the specialist should go away leaving him feeling so ill. He seemed to think that the neurologist should have put off his holiday until he knew whether or not his treatment was successful. The only effect produced by the Luminal was to make him "terribly sleepy." The neurologist, who referred the patient to me, was now consulted, and, on August 21st, the patient was admitted to hospital for further investigations, including lumbar puncture. His weight now was 9 st. in pyjamas, his normal weight being about 9 st. 10 lb. (stripped). A week later he was discharged from hospital having lost another pound in weight, feeling no better, and with no definite diagnosis made. He was advised to have a septic tooth extracted, and this was done a few days later. On September 25th a further examination was made by the neurologist, and by now the patient was very weak, still losing weight and vomiting several times a day. He was referred to me for further investigation on September 27th.

I now enquired what were the patient's chief complaints. I said, "Tell me what you notice wrong with yourself."

The main symptoms were (1) Loss of weight, about 16 lb. during the last few months. (2) Wasting of the muscles of the arms and legs and extreme weakness. "Two weeks ago," he said, "I could walk about two miles, now I can barely walk a hundred yards." He attributed this weakness to the Luminal. (3) Headache. This was chiefly a feeling of pressure, beginning behind the ears and extending to the nape of the neck on each side. It was especially noticeable on lying down, and was relieved by sitting up. There was also a throbbing pain in the right occipital region, but no throbbing and no pain in the temples. (4) Periodical nausea and vomiting, in which food was regurgitated. There was ample time to get to a "convenient place" before being sick. The vomit contained no bile and no blood, and there was no accompanying abdominal pain. These symptoms had been present for three or four weeks. When I asked him how he had reacted to his illness he said, "I feel very depressed because no one knows what is the matter with me, and I am so very weak. I am losing strength every day."

On further questioning I was told that neither palpitations nor tremors had been noted, but his writing had become very shaky. I then enquired about the past history.

The patient had suffered from a mild attack of sunstroke in India during the 1914-18 war, and also from jaundice and malaria. In 1916, while in India, he was thrown from a horse and fell on his neck. About two years ago he walked into an iron bar and hit the top of his head with sufficient force to cut the skin, but no after-effects were noticed. His two hobbies were ski-ing and motoring. He began ski-ing thirty-

one years before, and had continued up to the age of sixty-eight. He had also crossed the Sahara by car from north to south. He was fond of reading travel books.

My house physician and I now proceeded to read the neurologist's report sent to hospital with the patient. It was as follows: "The fundi show diffuse choroido-retinitis. The central nervous system is normal. There is no exophthalmos. The blood pressure is 145/75 mm. Hg. There is a fine tremor of the hands. The grips are good. The power of the legs is good. *Lumbar puncture*: Fluid clear, pressure 120 mm. C.S.F. Queckenstedt test normal. Protein 30 mg. per 100 c.c. Wassermann negative. Cells less than 1 lymphocyte per c.mm. *Blood-count*: Red cells 4·5 millions per c.mm. Hb. 82 per cent. C.I. 0·91. White cells 9,000 per c.mm., polymorphs. 64 per cent, lymphocytes 27 per cent, monocytes 8 per cent, eosinophils 1 per cent. Sedimentation rate (Westergren) 98 mm. plasma/1 hr. *Plasma proteins*: 7·1 G., albumin 3·1 G., globulin 3·1 G., fibrinogen 0·93 G. per cent. *X-ray of chest*: Chronic catarrhal changes and some calcium in the right hilum. *X-ray of spine*: No abnormality in the cervical spine. *X-ray of skull*: Bones, sinuses and pituitary fossa normal. *Blood urea*: 27 mg./100 c.c.

"There are no symptoms or signs of an intracranial lesion, except probably a mild cerebral arteriosclerosis, which, however, does not account for the headache. The somewhat localized tenderness suggests a perineuritis of the occipital nerves. I considered the possibility of an arteritis beginning in the occipital arteries, but on the whole I think that this is unlikely. The loss of weight suggested malignant disease, but no positive findings of this could be found. A simple adenoma of the thyroid is very unusual at this age, but there again the consistency of the gland does not suggest malignant processes. There were no signs of thyrotoxicosis. The raised E.S.R. and the increased fibrinogen content of the blood suggest infection, but the temperature is normal and no source of infection has been found. He is having radiant heat and a mixture containing potassium iodide and sodium salicylate. I have referred the patient to a physician for a report."

The physician wrote as follows: "Mr. P. has a small nodular goitre which is mobile. There are no signs of thyrotoxicosis or of malignancy. I do not think the goitre requires any treatment at the moment, but if it increases in size he should certainly see a surgeon. I could find no signs of infection, except perhaps in his remaining teeth. I have had these X-rayed. There is recession of the alveolar margin throughout the lower jaw, and a large area of alveolar absorption around the proximal root of the left lower second molar. This is very suggestive of infection. I think, therefore, that he should have his teeth attended to. He and his relations noted 'dilated veins' on his temples at the beginning of the illness. These are, in fact, thickened temporal arteries,

more pronounced on the right side than on the left. When I saw him they were tender and there was very little pulsation in them. These arteries are considerably thicker than his other peripheral arteries. I think, therefore, that temporal arteritis is a possibility as a cause of his headaches. A raised sedimentation rate is usual in this condition. A leucocytosis, not present here, is also usual, but not invariable. If his pain becomes more severe the diseased portion of artery can be removed."

As the patient was now tired by his long cross-examination I said that I would see him again the next day, and he thanked me for being so "patient." I then left the room and, turning to my house physician, said, "Well, I suppose you have made the diagnosis. You know my methods." I received no reply, although the evidence appeared highly suggestive.

And so I returned to the quest the next day to see if the clinical findings supported the view I had formed from the history. I proposed to find out whether there was evidence of carcinoma, whether thyrotoxicosis was present, and what was the condition of the muscles. As the patient lay in bed I noticed that his face was thin, his nose aquiline and chin prominent, but the complexion was pink, and I had been struck when I was questioning him the day before by the remarkable mental alertness, and by the fact that he looked considerably younger than his years. The tissues around the eyes appeared dehydrated, but there was no exophthalmos. The temporal arteries were visible and slightly tortuous, but they were not tender. Both lobes of the thyroid were enlarged, the gland was soft but slightly nodular, and there was a small area of retro-sternal dullness suggesting an intra-thoracic prolongation of the gland. The patient told me that his family had noticed the slight swelling in the neck in 1947, but it had not increased in size or caused him any inconvenience. The lungs were normal, the heart was not enlarged but there was a soft, localized, apical systolic murmur. The brachial arteries were slightly thickened, but not tortuous. Pulsation was vigorous over the femoral arteries, and a systolic thrill could be heard over the carotid and femoral arteries. The pulse rate was 100, regular, and the blood pressure 135/65 mm. Hg. The throat appeared normal. The tongue was dry and furred. The nails were small, but of normal shape. One small mobile gland was felt in the left axilla. The liver edge could be felt on inspiration below the right costal margin. The prostate was not enlarged and the mucous membrane was freely movable over it. The testes were normal. There were no abnormal signs in the central nervous system. Tenderness was noted in the occipital region, but no nodules were felt in the muscles. The palms were moist and there was a fine tremor of the hands. The skin was more moist than it had been formerly, but there was no profuse

sweating. The patient was calm and said that he did not feel at all nervous, and he preferred the hot to the cold weather. He noticed that he passed more urine by night than by day. I asked him to stand out of bed so that I could examine the skeletal muscles more fully. He was about 5 ft. 6 in. in height. The most striking feature was the wasting of the glutei, the skin over them hung in folds, and the patient said that sitting was very painful. As I looked at him from behind, I thought of Falstaff saying to Bardolph, "Do I not bate? do I not dwindle? Why, my skin hangs about me like an old lady's loose gown; I am wither'd like an old apple-John."

The legs were very wasted, and, after standing for a few minutes, the patient asked to sit on the bed as his legs were so weak they would not bear him. The biceps and triceps in each arm were wasted together with the suprascapular and infrascapular and the latissimus dorsi muscles on each side. There was wasting and weakening of the opponens muscle of the left thumb, so much so that the patient had found he could not hold a fork. The trapezii were not wasted, and elevation of the shoulders could be performed against strong resistance. The calf muscles were weak and wasted, and to a lesser degree the muscles of the thighs. The pectoral muscles were reduced in size and were weak, and there was myotatic irritability below the right clavicle. The right calf measured $11\frac{1}{8}$ in. in circumference, and the left calf $11\frac{1}{4}$ in. The right thigh measured $14\frac{1}{2}$ in. and the left thigh 14 in., $5\frac{1}{2}$ in. above the patella. The patient's weight had now fallen to 8 st. 6 lb. (in pyjamas). The urine contained no albumin and no sugar.

Further investigations were carried out during the next week. *Barium meal:* The barium passed normally down the œsophagus in both the erect and the Trendelenberg positions. There was no evidence of diaphragmatic hernia or of other abnormality. The stomach showed a normal mucosal pattern and good peristalsis, and only a small quantity of barium remained in it at one and a half hours. The duodenal cap filled out well and was not spastic, tender or deformed. Its rugæ were large, but no trace of an ulcer crater could be found. *X-ray of lumbar spine:* The vertebræ are somewhat osteoporotic. *Serum acid phosphatase:* 1.7 King-Armstrong units/100 c.c. (normal). *Serum alkaline phosphatase:* 2.3 King-Armstrong units/100 c.c. (normal). There was therefore no evidence of carcinoma found.

X-ray of chest: I asked for an oblique view, which had not been taken before, to see whether there was evidence of a retrosternal goitre. The report was as follows: "A triangular opacity is present in the superior mediastinum on the right side. The apex of the opacity extends downwards about $\frac{1}{2}$ in. below the sternal notch. This opacity is continuous with an enlarged thyroid in the neck which displaces the

trachea backwards and a little to the left, and the antero-posterior diameter of the trachea is a little narrowed. There is enlargement of the thyroid which extends downwards $\frac{1}{2}$ in. below the sternal notch."

Basal metabolic rate: + 17 (Aub du Bois). *Serum cholesterol:* 170 mg./100 c.c. (normal 170–220). *Serum calcium and potassium:* Normal, 9.5 and 20 mg./100 c.c. respectively. *Dextrose tolerance curve:* This showed slightly diminished sugar tolerance, the resting blood-sugar being 88, and the specimens after administration by mouth of 50 G. of dextrose being 146, 189, 190, 183 mg./100 c.c. at $\frac{1}{2}$ hour, 1 hour, $1\frac{1}{2}$ hours and 2 hours respectively. *Blood count:* Red cells 3.9 millions per c.mm. Hb. 72 per cent. C.I. 0.9. White cells 6,900 per c.mm., polymorphs. 76 per cent, lymphocytes 14 per cent, monocytes 8 per cent, eosinophils 2 per cent. Sedimentation rate (Westergren) 120 mm. plasma/1 hour.

The clinical picture was now much more sharply defined. Here was a patient with severe weakness, wasting of groups of muscles, an enlarged thyroid, a raised basal metabolic rate and a very high sedimentation rate. The elevation of the basal metabolic rate was not, however, sufficiently high to make a definite diagnosis of thyrotoxicosis, but this might be due to the fact that a mixture containing potassium iodide had been taken for two weeks previous to the present admission to hospital. If thyrotoxicosis was present, as I believed, the case fell into the group of masked thyrotoxicosis. In order to support this view it would be necessary to give a course of iodine for two weeks and then see whether this resulted in a definite fall in the B.M.R.

The diagnosis of thyrotoxic myopathy, which seemed to me possible on taking out the history, now appeared very probable. In the myopathies it is not unusual to find creatine excreted in the urine. A twenty-four hour specimen of urine was examined, and the creatinine content was 1,095 mg. (normal 1,000–2,000 mg.). There was no creatine, but this did not exclude the condition. I advised a course of iodine, and the patient was given one dose of a mixture containing 60 mg. of iodine. Being interested at this time in the diagnosis of thyrotoxicosis by the administration of a tracer dose of radio-active iodine, I thought that it might help to establish the diagnosis of thyrotoxicosis in this case. After consultation with the radio-therapist, the iodine was discontinued on October 6th after the first dose and, on October 11th, 40 microcuries of radio-active iodine, I^{131} , were administered by mouth. The uptake of radio-active iodine by the thyroid was only 12 per cent of the ingested dose, and the plasma clearance was 6 c.c. per minute. In thyrotoxicosis it is usual to find that 40–90 per cent of the ingested iodine is present in the thyroid at twenty-four hours, as estimated by a Geiger-Müller counter, but in some cases of thyrotoxicosis less than 30 per cent is retained in the gland. Further,

as the patient had taken potassium iodide in the salicylate mixture a few weeks previously, and one dose of 60 mg. of iodine a few days before the test, the result would almost certainly be vitiated, for the administration of iodine will lower the iodine uptake for periods extending up to several weeks or even months. Normally 40 c.c. of plasma are cleared of iodine per minute after the tracer dose is given, and in thyrotoxicosis the clearance rate may be raised to 100 or 1,400 c.c. per minute. These tests did not therefore confirm the diagnosis of thyrotoxicosis, but they did not exclude it.

I therefore advised that the patient should be given a course of Lugol's iodine solution, 10 drops t.i.d. for two weeks, in order to observe the clinical effect of the drug, and also to see whether it produced a fall of the B.M.R. The iodine was given for five days, with extraordinary results. The headache disappeared, the patient was able to walk along the corridor and up and down a flight of stairs, and to take a bath alone and lie down in it. Previously he had to be helped in and out of the bath and could only totter along the corridor. The weight which had fallen to 7 st. 13 lb. on October 13th, which was 25 lb. below his normal weight, rose to 8 st. 5 lb. The voice was stronger and clearer, and the patient said, "I now feel fit for anything. My walking is firm and fairly steady. My legs feel very much stronger. I feel brighter and better. My whole physical condition is far better."

The radio-therapist now told me that he considered the patient was suffering from thyrotoxicosis and that he would like to give him a therapeutic dose of radio-iodine. I therefore discontinued the iodine by mouth, and on November 6th, 5 millicuries of radio-active iodine were given by mouth. This takes up to about two months to produce its maximum effect, and so no further rapid improvement was to be expected. However, by November 11th the sedimentation rate had fallen to 85 mm. plasma/1 hour (Westergren), although the weight remained stationary at 8 st. 5½ lb. The power had returned to the left thumb, and the patient had no difficulty in holding his fork in the left hand. His face was fatter and the temporal arteries were no longer visible. The patient was disappointed that he was not continuing to make the rapid improvement that he did during the five days with iodine treatment, and that his condition was now almost stationary. I also shared this disappointment and wished we had not changed horses in mid-stream, and that we had continued the two weeks iodine by mouth, and then again determined the B.M.R. However, I hoped the radio-active iodine would prove as effective, although its result was necessarily delayed.

He returned home now to come back to hospital in a month's time for a further examination.

I saw Mr. P. again in the middle of December 1950. The general

practitioner told me that his patient had improved simply miraculously, and that he had never expected to see him about again. The patient, however, appeared to me to be somewhat apathetic. He said he was quite free from head or neck pains and that he felt very much better. On being questioned, he added, "I feel weak and that is all. I am driving my car and find it no trouble. I read but I tire very easily, and there is nothing else to do except read. I can get up now from a chair of normal height, but not from a low chair, without using my hands or arms to help me. I cannot stride out when I walk. I take short steps."

I found that the muscle tone had generally very much improved. The skin no longer hung in folds in the gluteal region, the right buttock was firm with no looseness of the skin over it, on the left side there were still a few creases in the skin. The chief weakness now was in hip flexion, and there was wasting of the quadriceps extensor on each side. The circumference of each thigh, measured $5\frac{1}{2}$ in. above the patella, was $15\frac{3}{4}$ in., an increase of $1\frac{1}{4}$ in. in two and a half months. The patient had difficulty in standing on one leg, and on doing so and flexing the hip to a right angle, the knee could only be extended to 45 degrees. The ankle and knee movements were very powerful when the patient was lying down. The circumference of each calf was 12 in., an increase of $\frac{3}{4}$ in. in two and a half months. There was still a little wasting of the left hypothenar eminence and some weakness of adduction of the left thumb. The supraspinati and latissimus dorsi muscles were also a little wasted. The biceps and triceps now both contracted powerfully on each side. The patient's weight (clothed) was 9 st. $7\frac{1}{2}$ lb., and stripped 8 st. 12 lb. He was now 12 lb. below his normal and had regained 13 lb. since October. The thyroid gland remained much the same size, the maximum circumference of the neck being $16\frac{1}{2}$ in.

The results of the investigations were not quite as satisfactory as the clinical findings. The sedimentation rate of the red cells had fallen to 65 mm. Westergren at one hour, but the basal metabolic rate was + 19, slightly higher than the original reading. The excess of fibrinogen had disappeared from the blood plasma, but the albumin : globulin ratio was reversed, the figures being, total protein 7.3, albumin 2.9, globulin 4.1, fibrinogen 0.3 G./100 c.c.

The patient was anxious to go for a voyage, starting in two days, but I persuaded him not to do so. Instead I ordered him to take Lugol's iodine solution, 10 drops t.d.s. in a little milk for a month, and arranged to examine him again then.

At the next visit, in the middle of January 1951, the patient was much less apathetic and now looked very well. He still complained of weakness of the thighs. This was especially noticeable in the act of sitting down on, or getting up from, a low chair. Unless he supported

his weight on his hands on the chair arms, he would fall with a bump the last few inches on sitting down.

The muscular wasting had, however, improved, each calf had increased $\frac{1}{8}$ in., and each thigh $\frac{3}{4}$ in. in circumference, the measurements being $12\frac{1}{8}$ and $16\frac{1}{2}$ in. The glutei were firm, but small, there being a hollow in the postero-inferior region, but the creases in the skin were filled out. There was no weakness of the hand, shoulder, arm or pectoral muscles, the patient could take longer steps than at his last visit and could walk a mile and a half without undue fatigue. The weight was 9 st. $7\frac{1}{2}$ lb. in pyjamas, a further gain of $9\frac{1}{2}$ lb. in a month, and this was within 2 or 3 lb. of normal. The patient was eating and sleeping well, but very bored with sitting about the house and reading. The sedimentation rate of the red cells was 46 mm. (Westergren) at one hour, and the basal metabolic rate + 4.

I advised that he should go back to work for five hours a day five days a week, and continue with the Lugol's iodine solution, 10 drops t.d.s. for another month. If the condition still further improved he could then go for a sea voyage.

And so he left me again, a strangely reticent individual who had never expressed gratitude for being rescued from what appeared to be certain death.

I saw Mr. P. again four times during the next fourteen months. In March 1951 he was walking better and feeling stronger, but did not consider that he was back to normal yet. He noticed weakness in both legs and could not stand on one leg for any length of time. The grip was good and the hands and arms appeared normal. The plasma proteins were now normal, total protein 6.5 G., albumin 3.6 G., globulin 2.6 G. and fibrinogen 0.3 G./100 c.c., but the sedimentation rate of the red cells was raised to 58 mm. plasma/1 hour (Westergren). The patient was taking 10 drops of Lugol's iodine solution t.i.d. every other week. The weight had fallen to 9 st. 3 lb. in pyjamas, a loss of $4\frac{1}{2}$ lb.

In July 1951 Mr. P. was brisk, alert, and very cheerful. He said, "I feel fine and everyone who sees me says what a difference from a few months ago. I am standing better, walking better, and I can now squat. All my muscles are normal except my seat muscles. I can now easily flex my hips with my knees extended, and I can drive the car 130 miles in a day. I am working hard at the office, and yesterday I did twelve hours there."

The gluteal muscles were firm and the skin taut over them, but there was still wasting of the gluteus medius on each side. The sedimentation rate of the red cells had fallen to 13 mm. plasma/1 hour (Westergren). The weight had again fallen to 8 st. $12\frac{1}{2}$ lb. in pyjamas, a loss of $4\frac{1}{2}$ lb. I now advised discontinuing the iodine drops.

In October 1951 Mr. P. reported that he now felt he was back to normal. He was doing the routine office work and attending certain extra committees, and was proposing to go ski-ing again in the winter. The sedimentation rate of the red cells was 11 mm. plasma/1 hour (Westergren), but the weight was only 8 st. 9 lb. in pyjamas.

I examined Mr. P. for the last time in March 1952. I was very pleased to find that the weight was now back to normal, 9 st. 10 lb. in pyjamas. He very wisely had not gone to Switzerland to ski in the winter, instead he drove his car to the Riviera. I could now find no evidence of muscular wasting or weakness, the sedimentation of the red cells was normal, 8 mm. plasma/1 hour (Westergren), and I felt justified in discharging him as cured.

Comment. This case falls into the category of chronic thyrotoxic myopathy, of which, according to Eder (1), there were, in 1950, at least twenty cases described in the literature. It is probably not very rare although liable to be overlooked. As Leslie Stephen writes, "the hardest of all feats is to see what lies before our eyes." The primary complaint is muscular weakness, and many patients are bedridden, some are unable to feed themselves. It most often affects males over the age of forty years, and in one of the recorded cases the basal metabolic rate was only + 14 per cent. The signs of hyperthyroidism are often slight and exophthalmos is uncommon. The response to iodine treatment is usually rapid, but in some cases in males, it is necessary to give injections of testosterone to restore completely muscular strength.

The very high sedimentation rate of the red cells in this case is interesting. It may be associated with the destruction of muscular tissue, but I have not been able to find any records of the E.S.R. in the myopathies, and the expert on the subject, whom I consulted, told me that he had no information on the matter.

This case is an example of how, in some cases, the diagnosis can be made on the clinical evidence alone, and confirmed by the response to treatment. The localization of the wasting to certain groups of muscles, in addition to the general wasting, had not been noticed and this gave the key to the solution of the problem.

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THE MISSING ABDOMINAL REFLEX

“ Despise no new Accident in your Body, but ask Opinion of it.”

OF REGIMEN OF HEALTH

BEFORE I first saw Mrs. R. in the spring of 1953 her husband, who was in this country on a short professional visit, gave me a somewhat complicated history of his wife's illnesses. He told me that he had been advised to arrange for her to come to London to consult me, and that they were at present living in Eastern Europe. Mrs. R. was now forty-four years of age, and had been married for ten years. She was healthy until the age of eighteen when she had a very serious attack of influenza. The husband described his wife at the time of their marriage as “a fragile creature weighing about 8 stones.” During the next few years she had several gynæcological operations designed to enable her to have babies, including a ventro-fixation, and her appendix was removed. Despite these manœuvres she remained barren, and the only noticeable sequel was a series of attacks of colon bacilluria which did not respond to the usual remedies such as sulphonamides or mandelic acid. The attacks eventually ceased, apparently spontaneously, and she remained fairly well for some years, until troubled with periodical flushings.

In May 1951 hysterectomy was performed in a hospital in London on account of flooding. A large polypus was found in the uterus and the left ovary was also removed. Mr. R. told me that his wife attributed her present illness to this operation. She considered that she was allowed to get up too soon after the operation, and that she suffered an internal injury by frequently climbing in and out of the high hospital bed to pass water. Shortly after returning home the abdominal wound broke down and the colon bacilluria recurred, but this eventually responded to a series of injections of streptomycin.

Three months later Mrs. R. joined her husband abroad, and, after a very strenuous summer, with numerous social engagements, suffered another attack of colon bacilluria. Streptomycin injections were again given, but they were not now so efficient, and it was sometime before the infection died out.

In the spring of 1952 Mrs. R. first noticed the symptoms for which it was proposed she should consult me. She felt there was something wrong inside her, in the region of the bladder, as if something was coming down internally, and she asked her husband odd questions, such as, “Can one's inside come out after an operation?”

During the summer of 1952 there were two more attacks of what was described as colon bacilluria which were treated with citrates.

During the second attack she was admitted to a hospital abroad, and numerous examinations were carried out. Several catheter specimens of urine were examined, all of which were sterile. Nothing abnormal was seen in the intravenous pyelograms and cystoscopy was normal. The final diagnosis was "abacterial cystitis of unknown origin, with some degree of functional overlay."

Mrs. R. next suffered from what was called a nervous breakdown. She became very tense, frequently burst into tears and had nerve storms. She consulted an internist, who said the symptoms were due to neuralgia of the bladder. He prescribed tonics and sedatives, injections of arsenic and the administration of stilboestrol by mouth. After a slight improvement the bladder symptoms recurred and have persisted since. The internist now took Mrs. R. to see a professor of neurology who, apparently on the strength of the bladder symptoms and of an absent abdominal reflex, gave a most disquieting report. "Although suffering from a depressive nervous disorder," he said, "nevertheless she has symptoms which might be the beginning of encephalomyelitis."

This expert opinion reduced the patient's husband to a state of anguish; every day on coming home he feared he might find his wife paralysed. And so he travelled to England and told me the story, and I advised that his wife should return home and be admitted to hospital in London to endeavour to clear up the diagnosis.

A month later, in March 1953, Mrs. R. arrived in London and came to see me. She was slim, delicate looking, with small features, and mousey hair. She did not exhibit any of the characteristics of the chronic invalid who enjoys ill-health, but was very anxious to be fit and to return to her life abroad. She told me she thought her husband had been unnecessarily alarmed by the neurologist's report. There had been no improvement in the symptoms, she was still troubled by the frequency of micturition which she described as "cystitis," by an aching feeling behind the bladder on walking, and by flushes. The urine was clear, alkaline, and contained no albumin and no sugar. The patient was taking alkalis at the time, for, on discontinuing them, the bladder discomfort and frequency of micturition increased, so that at night she had to micturate every time she awoke. The only abnormal sign I could find when I examined the central nervous system was the absent left abdominal reflex. What was its significance?

Mrs. R. was admitted to hospital the next day, and I first arranged for a neurological examination. The neurologist reported that the patient's history gave no suggestion of a neurological disorder. The left abdominal reflex was depressed, which might be related to the first abdominal section, when a ventro-suspension of the uterus was performed. "In one form of this operation," said he, "I think the

rectus sheath is entered and, as that part of the operation is done blindly, a nerve may easily be damaged." The report concluded, "I cannot believe there is evidence of a neurological disorder unless it were found that she had a neurogenic bladder."

The patient was now referred to a genito-urinary surgeon who finally banished the bogey of the absent abdominal reflex, for he found no evidence of a neurogenic bladder. The intravenous pyelogram showed no abnormality, cystoscopy was normal, and the urine was sterile, contained no albumin, and no pus cells or casts were found in the deposit. The genito-urinary surgeon discovered however, "an unusual amount of scarring on the anterior vaginal wall, corresponding with the site of slight tenderness on vaginal examination." A gynæcologist was the next on the list of specialists to be called in. His report read as follows: "There is a thick tender scar with puckering at the vault of the vagina following the hysterectomy. It is highly probable that this is fixed to the bladder. The patient therefore gets trouble with micturition and pain on coitus. She is also menopausal." The gynæcologist prescribed Mixogen tablets by mouth, one three times daily, and dienæstrol cream to be inserted with an applicator into the vaginal vault every night.

Three months later Mrs. R. came to see me again. She was a different woman, active, alert and feeling wonderfully better. There were no urinary symptoms and the vaginal trouble began to improve after six weeks' treatment. She said "I have more zest for life than I have had for years. I am quite sure I am not going to be ill any more." The flushes had ceased after taking the Mixogen tablets for three days.

After being labelled by one of the specialists "A stupid woman, who would not stop talking," she was now apparently cured by a little cream and a pill.

* * * * *

Five months passed before I saw our patient again, on her return to England for a short visit. There had been no relapse, there were no bladder symptoms and no internal discomfort. She had been living an active life, attending many social functions. I was deeply relieved to be given such a good report. Three weeks after rejoining her husband in Eastern Europe, I received a telephone message from him saying there was a slight recurrence of the vaginal symptoms, possibly owing to the fact that his wife had given up the treatment too soon. I advised that she should once more apply the dienæstrol ointment every night. This was followed by some improvement, but not nearly so marked as previously. And then, despite the nightly applications, there was a relapse. The pain and uncomfortable sensation high up

in the vagina recurred, which made her want to be continually emptying the bladder, for this afforded some relief. Walking, or even standing, now resulted in a severe sensation of traction behind the bladder, which disappeared on lying down.

Early in April 1954 Mrs. R. came again to England, and we had another consultation with the gynæcologist. He found the area of scarring in the vaginal vault much smaller and less tender than at the previous examination, and he recommended continuing with the application of the cream, and also a course of short-wave therapy to the pelvis. The alternative was a laparotomy to free the vaginal vault from above, but he feared there might be considerable adhesions in the pelvis, and was unwilling to embark on an operation, the indications for which were so uncertain. "Give me a lump," he said, "which I can see or feel and I will remove it. I do not like these intangible operations in which you may do the patient no good."

After another month of treatment the frequency of micturition disappeared, but the sensation of pulling and aching on standing or walking continued unabated. A month later Mrs. R. told me that she had been considerably upset by the last vaginal examination, that the affected spot had been very tender, although she had not complained of this at the time. There remained a feeling of intense soreness behind the bladder, and, on passing water, she experienced pain high up in the vagina on the left side. The pain was now waking her at night if the bladder was full. All the ground we had made seemed to be lost, and we were back on the position we occupied before beginning the treatment. The patient now could not stand or walk without great discomfort and a desire to micturate. I advised a period of rest in bed for three weeks, during which she was to continue with the application of the cream, and then report progress. It seemed that an operation afforded the only hope of cure, for if the symptoms were really due to an adhesion between the vagina and bladder, it was unlikely that the intravaginal application of the cream could be sufficient to free the bladder. If this were so how could the remarkable improvement during the first course of treatment be explained? Were the symptoms after all largely functional?

I think the gynæcologist now would have been only too glad to have handed our patient over to someone else, although he said that if the patient and her husband wished it, he would perform a laparotomy and see if the bladder was adherent to the vagina. He suggested asking another gynæcologist's opinion, but I wanted to avoid this in case he should emphatically rule out the advisability of an operation, which I felt was the only hope of cure.

After this period of rest Mrs. R. consulted me again. Her manner was distinctly resentful and slightly aggressive. She was clearly deter-

mined that something else must be done. She told me that the pain was now continuous and that her time was spent between her bed and her couch, owing to fear of walking which increased the pain and the desire to pass water. She added, "I just cannot go on like this. It is at the back of the bladder where everything is pulling. I am terribly tender inside since my last examination." I told her that I considered that an operation was necessary and I would speak to the surgeon about it.

The operation was performed a few days later. The sigmoid was found to be adherent to the left side of the pelvis. The bladder and left ureter were adherent to the vault of the vagina, and with some difficulty were dissected from it. The upper half inch of the vagina, which contained the scar, was removed.

The patient made a good recovery from the operation, and when she left the nursing home was free from all symptoms and was very cheerful and relieved to think that the cause of her trouble had been found and removed.

Nine weeks later Mrs. R. came in to see me. She looked wonderfully well and had made steady progress and now felt quite like her old self. "No longer," she said, "do I consider whether fetching something, say from upstairs, is worth the discomfort that such an effort is liable to produce. As of old my body can be ignored." A year later the patient wrote to tell me that she was perfectly well and leading a normal life.

Looking back on this case we can realize how justified she was in her complaints, how constant were her symptoms, and how closely localized to the seat of the trouble. This alone should have been sufficient to indicate that she was not a stupid neurotic woman.

“ULCERATIVE COLITIS”

MRS. B., the wife of a farmer, forty-one years of age, had been periodically prostrated by attacks of diarrhœa lasting several weeks or even months, for over three years when I first saw her in March 1954.

The diarrhœa began, for no known reason, on Christmas Day 1950. She suddenly had the desire to go to the lavatory, and, on doing so, passed blood with her motion. The diarrhœa with the passage of blood continued for several days and eventually she consulted her doctor, who kept her in bed for seven weeks. During this time the diarrhœa gradually lessened and eventually disappeared, only to recur two months later. The patient then attended the local hospital, and after three months' treatment with various astringent drugs the diarrhœa again ceased. Three more months went by and once more Mrs. B. was suddenly prostrated with a recurrence of the diarrhœa. This attack was more severe, lasting, with diminishing intensity, for ten months. A course of Sulphaguanidine was prescribed, which the patient took for several weeks. She again attended the local hospital where a barium enema and a sigmoidoscopic examination were carried out. The radiologist reported that the barium enema showed some decrease in the haustrations in the descending colon. On sigmoidoscopy an opaque, granular, easily bleeding mucous membrane was seen up to 15 cm., and above this level, up to 25 cm., the mucosa appeared comparatively normal, although blood and mucus were seen coming down from above. A diagnosis of ulcerative colitis was now made.

A consultant physician, who was visiting the hospital, was asked to see Mrs. B., when she had recovered from this third attack. He told her that she was now better and that there was no reason why she should have a recurrence of the colitis, but alas, the words were hardly out of his mouth, before her bowels gushed forth again.

Since August 1953 the condition had been much worse, the diarrhœa had not responded to any medical treatment, and continued relentlessly up to the time of the patient's visit to me in the following March. During these eight months Mrs. B. had been afraid to leave her house on account of the uncontrollable urge to have her bowels opened. In order to be driven to see me, a distance of some forty miles, she took nothing to eat or drink after the previous evening meal, and arranged with the district nurse for a colonic wash-out early on the morning of her visit to me. Although the patient realized she might be late for the consultation, as the nurse failed to come at the time arranged, yet she dared not leave home without having the wash-out for fear of having her bowels opened two or three times on the journey. When I offered

her a hot drink after the consultation she refused, saying she was afraid to take anything by mouth until she reached home, which would take about two hours. From this one can realize the state to which this unfortunate patient had been reduced by this devastating diarrhœa.

In addition to the colitis she had been troubled with swelling of the legs for about eleven years, the onset coinciding with the third month of the pregnancy with her third child. Three years ago Mrs. B. had an attack of phlebitis in the left leg. Later, in April 1953, twin children were born, and during this pregnancy the blood pressure was found to be high. Shortly before coming to see me, the second daughter, eighteen years of age, gave up her work in a bank in order to look after the twins, as her mother was so incapacitated by the diarrhœa that she was unable to do so.

Dr. S. sent a note with the patient saying that she was suffering from an anxiety state, ulcerative colitis and massive œdema of the legs. He added, "If the colitis is hopeless can you please suggest (1) Cause of the œdema. (2) Treatment." The patient appeared placid, cheerful, very sensible and not at all self-centred. She presented none of the characteristic features of the chronic abdominal invalid. She was fairly well nourished, being 5 ft. 9 in. in height, and weighing 9 st. 13 lb. (clothed). Her complexion was pink and there was no clinical evidence of anæmia, despite the frequent loss of blood. She told me that the bowels were usually opened eight or nine times in the twenty-four hours, generally by day. The motions were loose, and from time to time contained blood, but little slime. There was pitting œdema of both legs, the left calf measuring 14 in. in circumference, and the right calf 12 in. This difference in measurement suggested that the cause was local, and not due to a disorder of the blood, heart or kidneys. The urine was clear, and contained a trace of albumin. The heart was normal, the pulse regular, 96 beats a minute, and the blood pressure 150/100 mm. Hg. There was no thickening of the brachial arteries. I could find no abnormality of the abdomen on clinical examination, it was not distended, there was no tenderness, and the colon was not palpable. The opening of the bowels appeared to be related to the ingestion of food, as if there was an exaggeration of the gastro-colic reflex. The complete absence of abdominal pain is unusual in ulcerative colitis and suggested the possibility that the diagnosis was incorrect.

One could not help feeling very sorry for this comparatively young woman, who was afraid to leave her home even for short periods on account of sudden and uncontrollable actions of the bowels, and who was bearing her affliction so bravely. I advised that a course of anti-spasmodics should be given, Pro-Banthine, and tincture of belladonna, as there was probably a rapid intestinal transit time. A month later her doctor wrote to say that there was no definite improvement with

the treatment, and so I arranged for her admission to hospital for further investigations.

Mrs. B. came into hospital early in May and now told me that a new symptom had appeared. Since seeing me in March she had suffered almost continuously from abdominal pain low down on the right side. The bowels were opened about eight times by day, and not at all by night. The motions were light brown in colour and there was no blood or mucus visible. I examined the abdomen again and was surprised to find a mass in the right iliac fossa. It was easily felt, tender and measured 3 in. from above downwards, and 2 in. across. The mass appeared to be in the region of the cæcum and I wondered whether it was inflammatory or tuberculous. When the patient stood out of bed the abdominal wall was a little prominent over the region of the mass. There was now no œdema of the legs, the swelling having disappeared completely with the rest in bed. The temperature was normal. I asked a surgeon to see Mrs. B. and he reported “ I am uncertain about the nature of the lump on which you wanted my advice, but it strikes me as a possible carcinoma of the cæcum. The obstructive attack with colic which she recently had would fit in, as would the history of colitis. I also did a sigmoidoscopy and had a good view of the whole rectum, though not further. The appearances in the rectum are those of procto-colitis, with a rather watery-looking mucosa, which bleeds easily at the least touch. The barium enema will probably indicate the need for some sort of resection.”

A barium enema examination was therefore carried out, and the radiologist reported, “ The barium passed without any obstruction round to the cæcum. There was no filling defect or other evidence of abnormality. Evacuation of the colon was normal.”

The diagnosis was now clearly very difficult. There was no definite evidence the patient had ulcerative colitis, and, as mentioned above, there were points against the diagnosis. The previous diarrhœa may well have been due to intestinal hurry, but this would not account for the bleeding. The latest development, the pain and swelling in the right iliac region, might be due to an inflammatory mass or to a tuberculoma. If, however, the mass proved to be a carcinoma it would be unlikely that it was responsible for the diarrhœa which had been present for several years.

The pathological investigations which had been carried out threw no further light upon the condition. An examination of the stools showed no pus, blood, ova, cysts, parasites or pathogenic organisms. The blood urea and the plasma proteins were normal. The urine contained no albumin, and no casts were found in the deposit. There was a moderate degree of anæmia, the blood count being red cells 4·4 millions per c.mm., Hb. 82 per cent, C.I. 0·9, white cells 3,300 per

c.mm., polymorphs. 57 per cent, lymphocytes 27 per cent, monocytes 14 per cent, eosinophils 1 per cent, basophils 1 per cent. The Van Slyke urea clearance test showed a normal renal function of 101 per cent.

I examined the abdomen again two days later. The mass in the right iliac fossa was very much smaller and more difficult to detect. The cæcum now appeared to be thickened and tender, but there was no abdominal distension. After another three days the mass had disappeared, and all that remained resembled a thickened pencil-shaped ridge in the line of the cæcum, which was still tender.

Mrs. B. was given Sulphasuccidine by mouth, 10 G. daily, as a preliminary to operation, but the drug did not suit her. The abdomen became much more uncomfortable, and the bowel actions were increased from five to ten in the twenty-four hours. The patient did not look so well, the face being thinner and more pale, and after four days the Sulphasuccidine was discontinued. The operation was arranged for May 17th, but a few days before, an acute thrombosis developed in the left saphenous vein.

On May 27th a laparotomy was performed. Perhaps no one was more surprised than the surgeon to find an inflamed appendix. The appendix was in a retro-cæcal position. The colon was normal as far as the mid-transverse region, then it became very thin and spastic to the rectum. All the other abdominal organs were normal, except for a cyst, 1 in. in diameter, in the left ovary. The patient had asked to be sterilized at the operation, and, after consultation with a gynaecologist, it was decided that this should be done, owing to her prolonged illness, her age, and the size of her family, a girl aged twenty-one, a girl aged eighteen, a boy aged ten, and twins aged eleven months. The surgeon therefore tied both tubes and excised a short section from each. The pathological report on the appendix was "Swollen appendix, $2\frac{1}{2}$ in. long, with congested serosa. Section shows increased fibrosis of the appendix with chronic active inflammation in the wall."

After the operation streptomycin was injected intramuscularly, 0.5 G. every eight hours for three days. The drainage tube was removed on the fifth day. Ten days after the operation Mrs. B. said that she felt much better. The bowels were opened three to four times a day, but the urgency had disappeared; the motions were more formed than before the operation, but not yet of normal consistency. The patient went home on June 8th feeling and looking much better, and at the end of the month she wrote to report progress as follows: "I am now perfectly normal in my bowel actions. I eat all foods, which is lovely after nearly four and a half years' dieting. Since being about more on my legs, my ankles have started to swell again, the left more than the right, as always."

Six weeks later Mrs. B. wrote to me again. She said that she was very well and was frequently being told how fit she looked. There was no diarrhœa. The bowels were usually opened at about 9 a.m. and 5 p.m., but she was troubled with flatulence chiefly from the mouth. The legs were better than before the operation, but they were still swollen. She found that if she walked a good deal the swelling was considerably less, whereas on pottering about in the house the legs and ankles became larger. At Christmas 1954 Mrs. B. wrote to say that she was still very well and leading the normal life of a farmer's wife.

Comment. It appears probable that the mass which was present in the right iliac region for a few days was the cæcum distended by intestinal contents, and the tenderness was due to the inflamed retro-cæcal appendix. The diarrhœa was presumably secondary to the chronic inflammation of the appendix, and as soon as this was removed, the diarrhœa ceased. The diagnosis of ulcerative colitis was therefore incorrect and the swelling of the legs was due to a local cause, phlebitis, and not to a general one. Had it not been for the attack of abdominal pain with the appearance of the lump for a few days, and for the fact that the patient was examined at this time, the cause of the trouble would probably not have been discovered.

THE YOUNG ATHLETE

“ Know ye not that they which run in a race run all, but one receiveth the prize? ”

THE FIRST EPISTLE TO THE CORINTHIANS

A BOY, fourteen years of age, ran in the 100 yards race at school, early one June. Before the race he felt perfectly well. He failed to gain a place, and, almost immediately afterwards, was prostrated with palpitations, shortness of breath and giddiness.

Amongst the spectators at the sports was a doctor who made an immediate examination and found the boy very pale and collapsed, the pulse being imperceptible at the wrist. On palpation over the præcordium the heart beat was completely irregular. The boy was taken home in a car and put to bed; soon the tone of the heart improved and a few of the impulses were transmitted to the wrist. As, however, he still felt very giddy at 6 p.m., four hours after the race, he was taken to hospital and admitted with a provisional diagnosis of auricular fibrillation.

The house physician noted that the patient was cheerful and appeared to be quite fit, being unaware of any palpitations or cardiac irregularity. His only complaint was an occasional feeling of giddiness. The pulse was of good volume, but irregularly irregular, the rate at the wrist varying between 80 and 92, but at the apex the heart sounds were heard at over 160 beats a minute. There was no evidence of cardiac enlargement, no murmurs were heard over the præcordium, and there were no signs of right- or left-sided heart failure. The boy did not appear to be seriously ill, but at 9.45 p.m. he was examined by a cardiologist, who found the pulse rate 80–90 a minute, irregular and jerky. The cardiac rhythm at the apex was described as “chaotic.” There were loud beats, about 150–180 a minute, with numerous sounds in the background, too rapid to count. The electrocardiogram (see Fig. 9) showed what appeared to be an irregular ventricular tachycardia, with widened QRS complexes. The ventricular rate was 300 a minute. This is particularly interesting in view of the fact that Prinzmetal (1) states that such a rapid ventricular rate is impossible, and also because the patient was unaware of, and quite undisturbed by such an unusual rapidity of cardiac action. The nature of the arrhythmia was not clear, but it was suggested that the condition might be a ventricular tachycardia, or auricular fibrillation with little or no A–V block.

Five grains of quinidine were now given by mouth with a remarkable response, for one hour later the electrocardiogram showed a regular

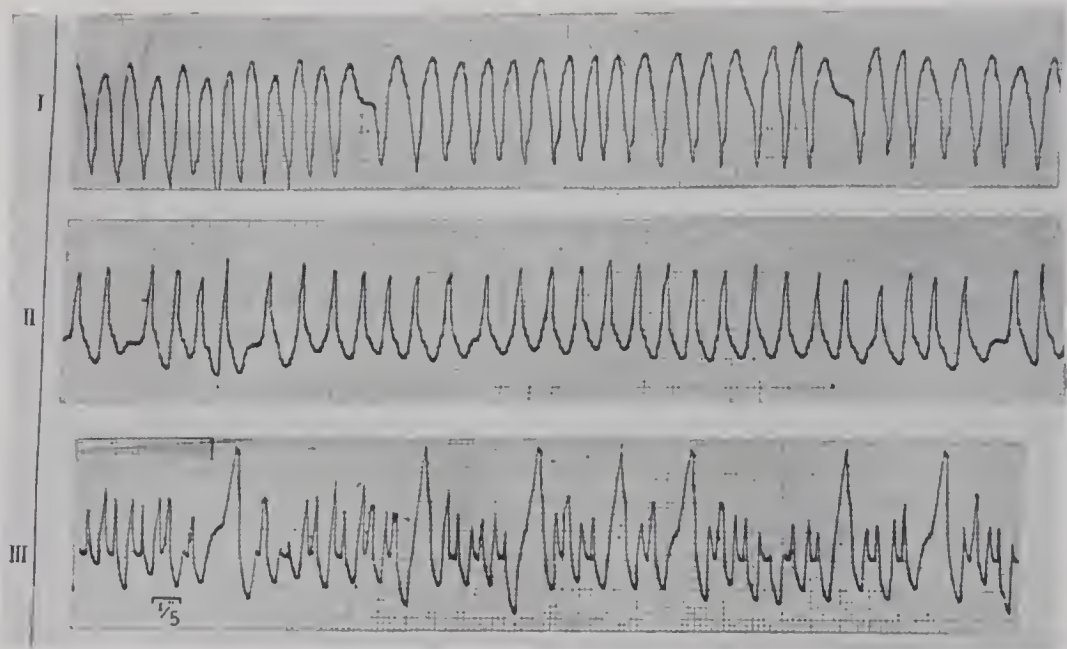


FIG. 9. Irregular ventricular tachycardia, 300/minute.

cardiac rhythm, 80 beats a minute, with a short P-R interval of 0.11 second (see Fig. 10). The normal P-R interval varies between 0.12 and 0.2 second, with an average of 0.16 second. The cardiologist suggested that there had probably been an attack of paroxysmal ventricular tachycardia. The patient was kept in bed and remained very well, quinidine being given by mouth in doses of gr. 3 t.i.d. A further electrocardiogram was taken two days later, which showed a

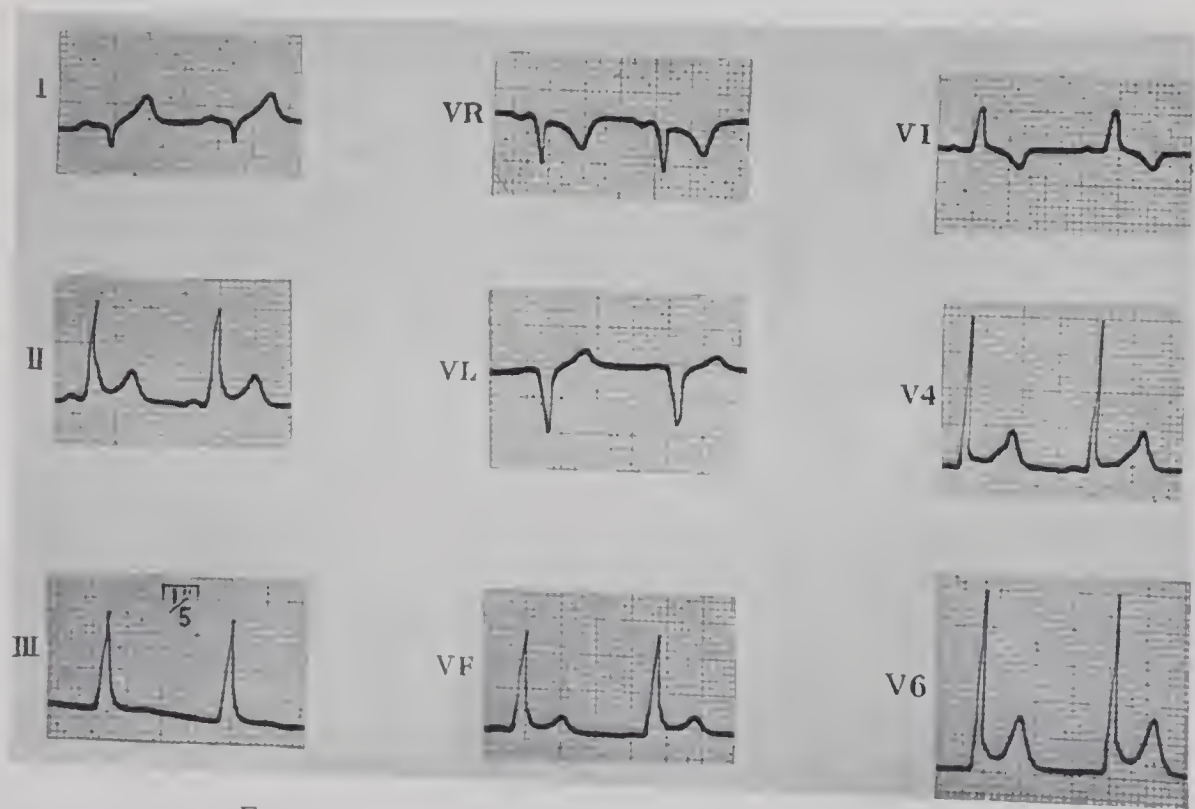


FIG. 10. Regular rhythm. Short P-R, 0.11 second.

regular rhythm, with a short P-R interval of 0.10 second. There was slight slurring between the P wave and the QRS complex seen in lead II and in leads V.5 and V.6, characteristic of "pre-excitation" of the ventricles, a condition frequently associated with paroxysmal tachycardia, and which is a form of the Wolff-Parkinson-White syndrome (see Fig. 11).

Excessive pulsation of the left ventricle and of the aorta was seen on screen examination of the chest. The left ventricle was prominent, and X-ray examination with a barium swallow indicated there was no enlargement of the left auricle. The patient was kept in hospital for ten days, during which time the temperature was normal.

On considering the history of the case it appeared to me unlikely that the original diagnosis of auricular fibrillation was correct, for

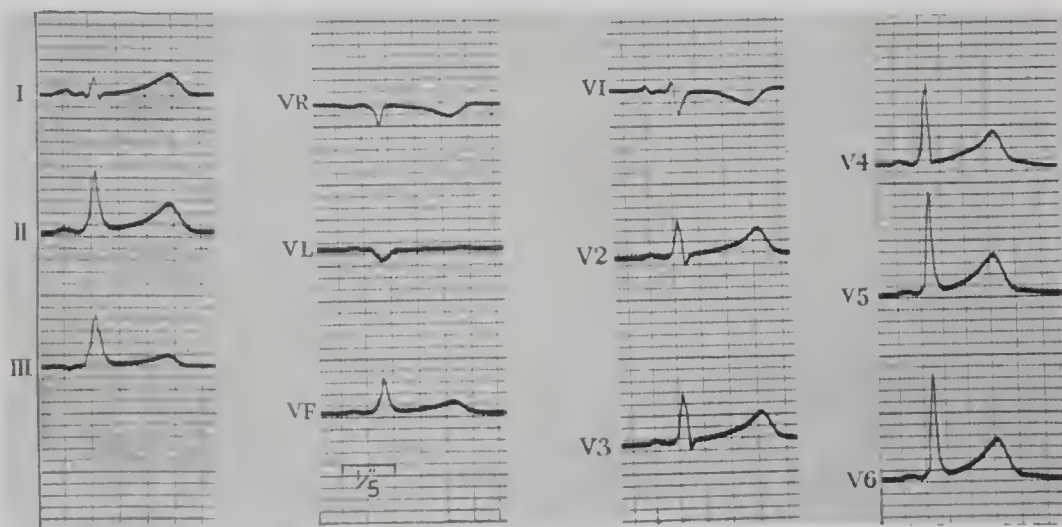


FIG. 11. Regular rhythm. Short P-R, 0.10 second. Slurring between P and QRS in Leads II, V.5 and V.6.

there was no history of rheumatic fever, chorea or growing pains. The patient's tonsils had been removed ten years previously, and the only illnesses from which he had suffered were whooping-cough at the age of four years, mumps and measles a year later, and chicken-pox seven years ago.

On returning home he was advised to take quinidine by mouth, gr. 3 t.i.d. for six weeks, and was forbidden to indulge in any running exercise. Two months later the boy returned to hospital for re-examination. He had only been able to take the quinidine for the first three weeks, as intolerance of the drug developed, resulting in nausea and headache. The heart was seen on screen examination to be of full size, but not enlarged. The rate was 60 a minute, there were no murmurs, but sinus arrhythmia was present. The blood pressure was 130/60 mm. Hg. The electrocardiogram (see Fig. 12) showed a short P-R interval of 0.10 second with slight splintering of the QRS complexes,

and the condition was diagnosed as the Wolff-Parkinson-White syndrome. The physician advised the boy that he must not run in any race or play football, except perhaps in goal, for the next few years, and should a further attack of tachycardia occur, he must take quinidine gr. 3 immediately.

Comment. The most interesting feature in this case, from the clinical point of view, was the fact that the patient was undisturbed, when resting in bed, by a ventricular rate of 300 a minute. This syndrome was first described by Wolff, Parkinson and White (2) in 1930. The characteristic electrocardiographic features are: (a) Shortening of the P-R interval, usually to 0.12 second, or less. (b) Widening of the QRS complex. There is often a gradual slope of the QRS complex, with slurring at its onset. The P-S interval is normal. (c) Changes in direction of the QRS complex, with right or left axis deviation.

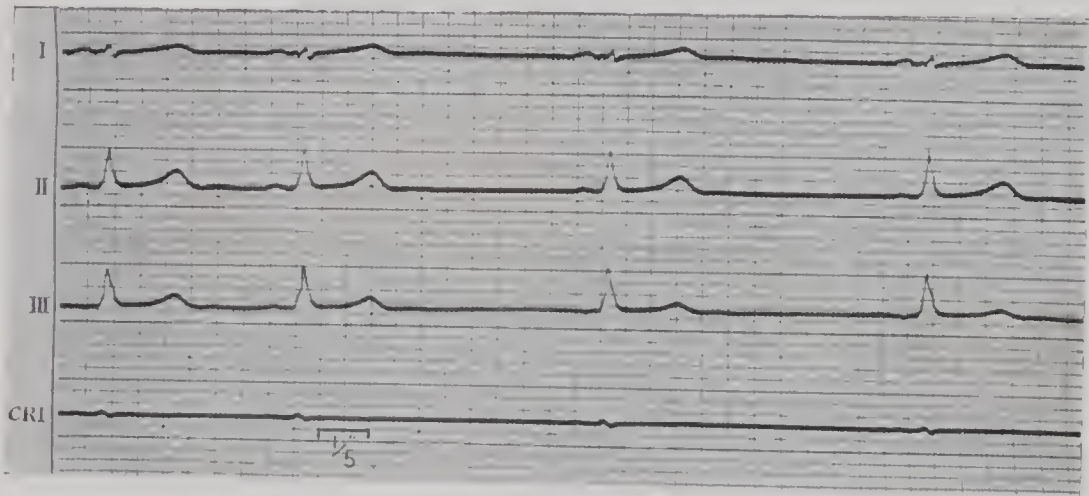


FIG. 12. Sinus arrhythmia. Short P-R, 0.10 second. Slight splintering of QRS.

(d) Changes in the S-T segments and T waves. (e) Paroxysmal supra-ventricular tachycardia, auricular extrasystoles, auricular flutter or auricular fibrillation. The condition was originally described as bundle-branch block, but it is now thought to be due to "pre-excitation" or to "accelerated conduction." This means that the impulse, instead of being delayed in its passage from auricle to ventricle, is accelerated. Many theories have been propounded to account for the W.P.W. syndrome, and they fall into two groups. Thus the impulses may pass unduly rapidly from auricle to ventricle along an abnormal connecting path which is present at birth. Such a bundle was described by Kent (3) in young rats and rabbits connecting the right auricle with the right ventricle, and he subsequently identified it in the human heart as the "right lateral bundle." The impulse, passing along this tract, would reach the right ventricle before arriving at the left ventricle. Alternatively, the impulse may travel from auricle to ventricle along the normal pathway, but its passage through a portion of the A-V

node may be accelerated. There is normally a delay in the passage of the impulse from auricle to ventricle in the A-V node, otherwise the auricles and ventricles would contract simultaneously. If we accept the latter theory then the site of production of the W.P.W. is nodal. Prinzmetal has postulated that in some cases the stimulus arises in the ventricle, giving rise to ventricular tachycardia. It can be produced experimentally by catheterization of the ventricles in man or by electrical stimulation of the ventricles in dogs. It is thought to be an acquired and not a congenital abnormality, associated with some disease of the heart muscle, such as may occur after coronary thrombosis.

If in the case described above, the tachycardia is ventricular and not supraventricular in origin, it is unusual as it occurred in what is apparently a healthy heart.

The W.P.W. syndrome generally shows itself before the age of thirty, and males are said to be affected more commonly than females. Schott (4) has described a case which was diagnosed in an infant aged eight months, associated with probable congenital heart disease. In children or adults the condition is usually benign, but sudden death may occur in an attack of tachycardia. The attacks are very liable to develop after exercise, but why a portion of the A-V node should allow the impulses to pass through unduly rapidly, or why a focus of activity should suddenly develop in a ventricle, are questions which at present have received no satisfactory answers.

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ARTHRITIS ?

*“ We are not ourselves,
When nature, being oppress’d, commands the mind
To suffer with the body.”*

KING LEAR

ONE day in the late spring of 1954 I was asked by a rheumatic specialist to see a lady, sixty-one years of age, whom he had treated for about two years for “an active arthritis, though not the rheumatic type.” The measures employed varied from an anti-rheumatic vaccine to Auro-Calcium, progesterone and heavy doses of vitamins B₁ and B₆. Several teeth had also been enthusiastically extracted to eliminate a possible source of focal sepsis. The patient, unfortunately, made little or no progress and the hands were getting worse. The sedimentation rate of the red cells was said to have increased considerably between June 1952 and April 1954. The rheumatologist concluded his letter to me thus: “Her complexion has been almost jaundiced, and I shall be most grateful if you could give me a diagnosis and suggestions for treatment.”

After reading the letter, in which these details were given, I had little hope of being able to throw any further light on the problem. The condition appeared to be a steadily progressive multiple arthritis.

The patient consulted me towards the end of May. She told me that she had led a “very busy, tiring and strained life” for many years. In addition to household duties she was a successful novelist, but lately had been so tired that she felt she could carry on no longer. Both power of concentration and memory were much impaired, writing had become very difficult, and, owing to stiffness of the fingers and shakiness of the hand, she could hardly sign her name. On further questioning, Mrs. K. said “I tried to write another novel, but I sat for an hour and could not write the first page. Eventually I wrote the first chapter sixteen times and then gave it up, as I was mentally jittery and making mistakes. I am so tired, all I want to do is to lie on a sofa.”

For the last two years, following an attack of pneumonia, the symptoms had become slowly and insidiously more severe; the patient was now, as she expressed it, “stupidly tired,” and had difficulty in getting up and down the many stairs in her home, owing to fatigue and depression, rather than to shortness of breath and palpitations. During the last two years or more there had been a steady increase in weight, especially around the waist, and the face had become fuller

with swellings under the eyes. Mrs. K. said to me "I wonder whether this very unpleasant swelling of my fingers and my depression and liverishness could be due to gout." She added that her clothes no longer fitted and that she noticed swellings all over. She was much troubled during the night by a "pins and needles" sensation in the hands and wrists, but the hands were not stiff on waking in the morning. This made me suspect that the condition was not one of rheumatoid arthritis.

For the last thirty years, following sleeping in a damp bed on a farm, Mrs. K. had been subject to rheumatism, and paid periodic visits to spas abroad, such as Aix-les-Bains and Loèche-les-Bains.

I now made my examination. The patient's movements were all slow and heavy, the voice low-pitched. The face was round and full, with swellings under the eyes. The complexion was sallow and the skin generally had a slightly yellowish tinge, although there was no icterus of the conjunctivæ. The skin was dry and flaking off the abdomen and legs. It was thickened on the forehead, on the palms of the hands, and in the interdigital spaces. The fingers were stiff and swollen, and the subcutaneous tissue felt thick. Heberden's nodes were present at the proximal extremities of some of the distal phalanges, but there was no evidence of arthritis elsewhere. The grip was not reduced, as is always the case in active rheumatoid arthritis affecting the hands. The patient told me she felt the cold very markedly, and I noted that the skin of the body and limbs was cold to the touch. There was no œdema of the legs or ankles. The weight was 10 st. 3 lb. (clothed), which was about a stone above the patient's normal weight, the height being 5 ft. 7 in. There was border-line enlargement of the heart, as shown on X-ray examination. The heart sounds lacked tone, in fact they were extremely feeble, but there were no murmurs. A further noticeable feature of the cardiac examination was the slowness of the beats, only 48 a minute. The blood pressure was 134/70 mm. Hg. The urine contained no albumin and no sugar. The lungs were normal. The abdomen was normal, apart from the flabby fat in the subcostal region. The thyroid gland was palpable, and an adenoma, 1 in. in diameter, was visible and palpable in the right lobe. The mouth temperature, taken in the afternoon, after five minutes, only registered 97° F. I took an electrocardiogram. The curves were of low voltage. The P and T waves were flat in the three standard leads, and T was inverted in CR₄. The P-T interval was prolonged to 0.6 sec., the normal averaging 0.46 sec., so there was delay in conduction of the impulse through the whole heart. The rate was 50.

The diagnosis was obvious, although it had been overlooked during the last two or three years. This was probably due to the insidious onset of the changes which progressed so gradually that those

in closest association with the patient did not notice them, whereas to the stranger, seeing her for the first time, they were clearly apparent.

There could be only one diagnosis which would explain all the features of the case, the mental deterioration, the hebetude, the gain in weight, the dry cold skin with a slightly yellowish tinge, the stiffness of the hands, the thickening of the skin in certain areas where it almost assumed the consistency of tortoise skin, the constipation, the slow pulse, the low temperature, and the low voltage curves in the electrocardiogram. Seeking for a further confirmation of my diagnosis, if further confirmation were required, I asked "Has your voice altered, Mrs. K.?" to which she replied, "Yes, it has. When I answer the telephone my friends think it is the man-servant speaking."

All the textbook features of myxœdema were not present, but they never are in an individual case. Thus there was no loss of hair on the head or on the outer sides of the eyebrows, there was no malar flush, there were no supraclavicular pads, there was not the inane expression on the face which one usually sees in photographs published to illustrate myxœdema, there was no enlargement of the tongue and no deafness. But there was ample clinical evidence on which to make the diagnosis, and the solution of the problem was much simpler than I expected when I read the introductory letter.

In such a severe and long-standing case of myxœdema it is advisable to admit the patient to hospital in order to observe the effect of treatment and to establish a maintenance dose of thyroid extract. Further, the administration of the thyroid must be begun in very small doses and the amount cautiously increased, so as not to put a strain on the enfeebled heart and not to produce anginal symptoms as the metabolism accelerates. The patient was also desperately in need of a complete rest in bed as part of the treatment.

The investigations confirmed the diagnosis of myxœdema, for the basal metabolic rate was low, — 36 per cent (Robertson Reid), and the serum cholesterol high, 350 mg./100 c.c. There was only a very slight degree of anæmia, the blood count being red cells 4.6 millions per c.mm., Hb. 93 per cent, C.I. 1.0, white cells 10,700 per c.mm., polymorphs. 78 per cent, lymphocytes 18 per cent, monocytes 3 per cent, eosinophils 1 per cent. Despite the gloomy report on the sedimentation rate of the red cells before admission we found the reading to be 7 mm. plasma/1 hour (Westergren) and 12 mm./1 hour (corrected for anæmia. Wintrobe).

Treatment was commenced with thyroideum (B.P.) gr. $\frac{1}{4}$ daily by mouth, increasing by gr. $\frac{1}{4}$ daily. Five days later Mrs. K. told me she was much more cheerful, but she added, "I still feel very limp and utterly lazy." The apex rate was 50 a minute, and the first heart sound was a little stronger. After another four days, when the dose of

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thyroid extract had been increased to gr. $\frac{1}{2}$ q.i.d., the apex rate had risen to 58 a minute. The skin was very dry and the patient still complained of the cold, although confined to bed. She said, "I feel much more cheerful, but frightfully indolent. I had a bath this morning and feel I have done a hard day's work. I am beginning to enjoy doing nothing. The tingling has gone from my hands." By now there was a distinct change in her appearance, the face was thinner and the voice of a higher pitch. At the end of the second week the thyroid dosage had been raised to gr. $2\frac{3}{4}$ daily. The urine output now suddenly increased from 60 to 105 oz. in the twenty-four hours. I had been looking for this diuretic crisis as indicating the efficacy of the thyroid treatment, and, as usually happens, a few days later the renal excretion fell to about 80 oz. in the twenty-four hours.

When the thyroid dosage reached a total of gr. $3\frac{1}{4}$ in the twenty-four hours Mrs. K. felt for the first time a little hot and experienced slight præcordial discomfort. The apex rate had now risen to 70 a minute, and the temperature was a degree higher than on admission, 98.2° F. as against 97.2° F. The weight had fallen from 10 st. (stripped) on admission, to 9 st. 6 lb. The dose of thyroid was maintained at gr. $3\frac{1}{4}$ daily for the next ten days, until June 26th. The basal metabolic rate had now risen to + 1 per cent. The skin was slightly moist in the axillæ and on the back of the hands it was more lax, the palms were softer and the swelling of the fingers less noticeable. There had been no recurrence of the tingling of the fingers or hands. Mrs. K. was more alert, but she said, "My body is clumsy rather than weak. I feel I have not control of my body on getting out of bed in the morning, especially on taking a comb to do my hair, and I am very apt to drop things." She was now reading quite serious books, but she said, "I read as if I had a slight temperature. I take in what I am reading at the moment, but ten minutes later I could not pass an examination in it. I feel that my mind has lost its edge, and I am doing everything in a doze." By June 30th the patient was out of bed for six hours a day with her clothes on. She was walking a little along the corridor, but felt very tired after each excursion. The electrocardiogram was now normal the deflections were well marked, and there was no electrocardiographic evidence of myxœdema.

Mrs. K. complained, however, that her hand was still shaky if she tried to write a letter or even sign her name, and her powers of concentration had not improved at all. The skin was now terribly itchy all over, but especially at the back of the scalp. The blood pressure had risen from 120/72 mm. Hg. on admission to 145/85 mm. Hg.

Two weeks later I increased the thyroid to gr. $3\frac{1}{2}$ daily, because, although the body had responded well to the treatment, the mental faculties, especially the power of concentration, showed little change.

Had the condition been diagnosed sooner and the treatment commenced earlier, it probably would not have been necessary to give a larger dose than gr. 3 a day of thyroid extract, to restore the patient to mental and bodily well-being.

She was now walking out of doors each day in the garden, and I began to exercise her on the stairs, first one stair a day up and down, increasing by a step daily up to nine stairs. On July 31st I increased the thyroid to gr. 1 q.i.d. With this dose she felt more energetic and the palms and axillæ were moist, but the mental faculties were still impaired. In order to improve these I increased the thyroid by gr. $\frac{1}{4}$ daily up to gr. 5 a day.

Mrs. K. now noticed a distinct improvement in concentration and she felt brighter, in fact I made a note that she was extremely vivacious. She tired, however, very quickly on walking, and found visitors very exhausting if they extended their stay to three-quarters of an hour. Her weight was slowly falling and it was now 8 st. 7 lb. (stripped) and she was too thin for her height. Five and a half grains of thyroid a day proved too much, the patient being conscious of a feeling of heat and of præcordial discomfort, and so the maintenance dose was fixed at gr. 5 a day, administered now as a single tablet in the morning.

The patient left hospital after a stay of three months, taking with her a supply of thyroid gr. 3 and gr. 1 tablets, so that she could either take gr. 5 or gr. 4 a day according to the weather and her reactions, and I told her that during the winter she would probably require a slightly larger dose than in the summer. She was very much better mentally and physically, but in view of the serious cerebral and cardiac symptoms when I first saw her I arranged that she should have a period of convalescence of three to four months before resuming her active life at home. I hoped that with change of air and food she would put on several pounds in weight, and after being out of hospital a few weeks, it might be possible to reduce the thyroid dosage slightly.

Three months later Mrs. K. had gained 9 lb. in weight and was feeling "incredibly better," although still easily mentally tired by dictating complicated letters. She was alert, active and cheerful, and continuing to take the same dose of thyroid, gr. 5 every morning. After a further seven months Mrs. K. appeared stabilized on a daily dose of thyroid, gr. 3.

AN EARLY COUNTRY CASE

ONE morning in July 1926 I received a telephone message asking me to come as soon as possible to see a patient who was very ill in North Wales. I had made all arrangements to go away for my summer holiday the next day, but had no hesitation in deciding to postpone my departure for a day, for country cases were still few and far between and a consultation 250 miles distant had not yet come my way.

Leaving Euston by the 8.45 night mail we made a quick run to Chester, arriving there some three hours later. I had now to change into a slow train for Bangor. Chester Station was almost deserted, the waiting room and refreshment room were closed, and there was nothing for it except to walk up and down the platform for three hours in the chilly night air. The Bangor train came in just before 3 o'clock and we then made our way slowly along the coast of North Wales. I was alone in the carriage and watched the dawn coming over the sea. Not being engaged in a midwifery practice, I could still appreciate the beauties of the early morning.

“ At last, the golden oriental gate
Of greatest heaven gan to open fair;
And Phœbus, fresh as bridegroom to his mate,
Came dancing forth, shaking his dewy hair.”

It was a lovely sight, the sunlight glittering on the pearly sea, its beams reflected from the wet and tawny sands.

At 5 a.m. I left the train at Bangor and was met by Dr. D., who had previously operated on the patient. As we drove in his open car the thirty miles to a seaside town on the west coast of Wales, Dr. D. told me that he had, three weeks before, removed what had appeared to be a “clean” appendix from Mr. H., following an attack of abdominal pain. Twenty-four hours after the operation the patient suddenly collapsed, became very pale, short of breath, and was almost unconscious. After a few hours, with stimulant treatment, he had rallied, but since then had become progressively weaker, with continuous shortness of breath, a rapid pulse and a high swinging temperature. There was nothing typical of a pulmonary infarct, for the patient had no cough, no expectoration, no hæmoptysis, and no pain in the chest. The County Tuberculosis Officer had been called in consultation and he found signs of consolidation at the base of the right lung, and considered the patient was suffering from pneumonia.

The sudden onset, within twenty-four hours of the operation, suggested to me that the most likely diagnosis was a pulmonary

embolus, which had now become septic, although post-operative emboli usually occur about ten days after an abdominal operation.

We arrived at the house of the general practitioner at about 6 a.m., I was rather "weak and wan from want of food and sleep" and hoped that I should be asked in to have a cup of tea before going to see the patient. We knocked at the front door, and in a few minutes a figure, clad in pyjamas, appeared at a first-floor window. It was the doctor, and throwing up the window, he stood there, yawning. My hopes of being invited in were quickly dispelled when he said "I will be down in a minute and we will go straight on to the patient." Putting on a pair of trousers and an overcoat over his pyjamas, he appeared at the front door and said "We must hurry. I saw the patient late last night and he was very ill. I very much doubt whether we shall find him alive." We now drove on another ten miles to a farm in the heart of Wales. The house was surrounded by trees, and, as it came in sight, we saw a light in a bedroom window. Dr. P. said "There's a light in his room. That means he is still alive."

We went upstairs and I found a middle-aged man, who was clearly very ill. He was flushed and cyanosed, with sordes on his dry and cracked lips. The respirations were rapid and shallow, the pulse rate 110, and the temperature 101° F. He appeared to be suffering from a profound toxæmia. I found no abnormal signs in the abdomen, but on examining the back of the chest, just below the interlobar fissure on the right side, there was a small area of dullness, with weak bronchial breathing, a few fine râles, and faint whispering pectoriloquy.

I came to the conclusion that the severe toxæmia must be due to a localized collection of pus in the chest, either in the interlobar fissure or in the lung substance. The pulmonary infarct had become now an interlobar empyema or a lung abscess. With a long needle I explored the chest over the line of the interlobar septum, but found no pus. I now turned the patient from side to side, tapping the chest somewhat vigorously over the dull area, with the hope that the patient would expectorate the pus, but nothing happened. The only treatment available appeared to be the application of kaolin poultices and the administration of an expectorant mixture. Having done all that we could we drove back to the doctor's house, where, after a refreshing shave, we breakfasted in a room overlooking a lovely garden. The sun was shining brightly over the green lawns, surrounded by flowering shrubs and fuchias in full bloom, and the sea could be seen shimmering in the distance. A little later I was driven back to Bangor and, catching the morning train, arrived at Euston in time for dinner.

The next day I set forth for my holiday, with a cheque in my pocket which made all the difference to my summer holiday. I wondered whether I had done everything possible and what would

be the fate of the invalid. A few days later I received a letter from the general practitioner telling me that shortly after we left the patient had coughed up about an eggcupful of pus. This was rapidly followed by a fall in the temperature to normal and there appeared to be every hope of a steady recovery.

OVARIAN ASTHMA

"Some griefs are med'cinable."

CYMBELINE

I HAVE called the disability from which this patient suffered ovarian asthma, as it appeared to be closely related to the periodical changes in ovarian function.

Mrs. B., a married woman, thirty years of age, had been employed recently as an assistant in a confectionery business. She was first married in 1937 at the age of seventeen, divorced in 1944, and married for the second time two years later. The early signs of asthma showed themselves in 1940, when the patient was living in the country; she noticed that from time to time her breathing was slightly wheezy, but paid little attention to it, not being able to foresee to what an extremity of suffering she would be reduced in a few years. The attacks gradually became more severe, and in May of 1949 she was admitted to hospital in *status asthmaticus*, and this necessitated her remaining in an oxygen tent for a few days. A notable feature of the illness was the failure of injections of adrenaline to give relief.

I was asked to see the patient in July 1950, the doctor writing to me as follows: "The attacks are occurring more and more frequently lately. She has been seen by an E.N.T. specialist and her sinuses have been radiographed, but negative results were reported. Her chest X-ray was also negative, and, apart from the usual asthmatic signs, there is nothing to be heard. I have had her on Anthisan, Antistin and Thephorin by mouth at varying intervals, and Brovon by inhalation, and adrenaline by injection. She is becoming very depressed and anxious about the whole condition and wonders whether it will be all right ever again. I feel sure there must be some focal cause for the attacks, even though the upper respiratory tract is apparently clear."

My clinical examination revealed little abnormal. The patient was of slight build, 5 ft. 2 in. tall, and weighing 7 st. 4 lb. (clothed), having lost 1½ st. in weight during the last twelve months. She was alert but anxious looking, with dark hair, bright eyes and somewhat pinched features. I noticed that her nails were bitten, and on drawing attention to this was met with the reply that she could not stop herself from biting them during the attacks of asthma. The lungs showed slight signs of bronchitis, expiration was a little prolonged all over, and there were a few scattered rhonchi. The heart was normal, the blood pressure 112/70 mm. Hg. and the urine contained neither albumin

nor sugar. I could find nothing abnormal on abdominal examination. An X-ray film of the chest showed no evidence of disease of the lungs, but on screen examination the diaphragm movements were seen to be very poor, only $\frac{1}{4}$ in. on each side.

I now made further enquiries about the asthmatic attacks. They appeared to have no relationship to locality, foods, animals or seasons. There was, however, one significant fact, the attacks occurred fairly regularly, usually beginning about ten days before the onset of each period. The periods were regular, recurring every thirty-five days and lasting for three days. The total loss was about normal and there was no dysmenorrhœa. The patient was very downhearted and full of despair. "Each attack," she said, "practically bowls me over."

I arranged for her admission to hospital so that breathing exercises could be given to increase the movements of the diaphragm, and also that I might try the effect of injections of progesterone. The blood count was normal on August 22nd, and there was no eosinophilia. The sputum contained no pathogenic organisms. On September 2nd, 4th, 6th and 8th, 1 c.c. of Synergon was injected intramuscularly. This preparation contains in each cubic centimetre 10 mg. of progesterone and 1 mg. of œstrone, a derivative of œstradiol. The period began on September 8th and lasted three days, when a mild attack of asthma developed. Two days later the patient left hospital, with instructions to inject 1 c.c. of Synergon intramuscularly, beginning seven days before the next period was due, the injections to be given every other day for five doses, and to be repeated each menstrual cycle at the same time.

The result was extremely satisfactory. Six months later, in March 1951, Mrs. B., on consulting me again, said "I am thankful to be no longer an invalid." She was now leading a normal life, had gained 10 lb. in weight, and had suffered no attacks of asthma for the last three months. About ten days before each period the chest became "a little clogged up," and there was cough with some expectoration. In October 1951 I once more examined the patient. During the last six months she had been free from all asthma, except for one attack when she had not received the injections before her period. I last saw her in June 1952; she had been receiving the injections regularly, had been free from all asthma, and her weight had increased by another 10 lb. The periods were still recurring every thirty-five days, and now lasted for four days. "It is marvellous," she said, "to have no asthma, and I have actually done a little swimming."

In January 1953 I wrote to enquire for further news, and this was her reply: "I am 100 per cent fit. I have had no attacks of asthma since I saw you last. The last two months I did not have the injections, and three days before the period I was a little wheezy, mostly at night

and in the latter part of the day. My periods are now very regular, on the 18th day of each month, and last four days.”

Comment. It is believed that the ovary secretes two hormones, œstradiol, produced perhaps by follicular tissue, which has œstrogenic

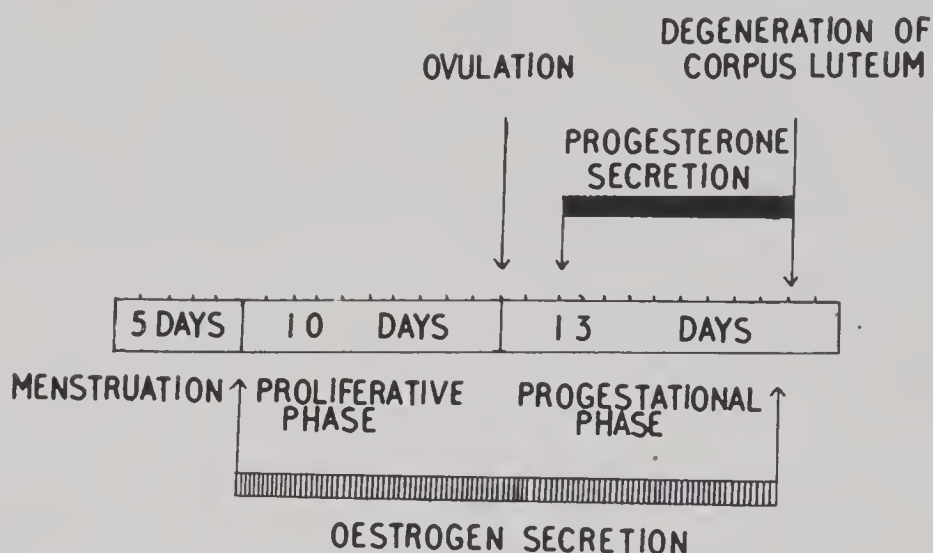


FIG. 13. THE MENSTRUAL CYCLE.

The Proliferative Phase. The mucous membrane of the uterus becomes thickened, more vascular, and the glands dilate in their deeper part.

The Progestational Phase. The mucous membrane thickens, the glands enlarge and are filled with mucus. The blood vessels become congested and exude a clear or blood-stained fluid.

Menstruation. The superficial part of the endometrium is shed and bleeding occurs.

properties, and progesterone, formed in the corpus luteum. In the normal menstrual cycle, when menstruation ceases, œstradiol alone is secreted from the Graafian follicles until ovulation occurs. This period lasts for about ten days, and is known as the proliferative phase. About two days after ovulation progesterone is secreted, together with a diminishing amount of œstradiol, and the secretion continues for about thirteen days, ceasing two days before the onset of menstruation. This is known as the progestational phase (see Fig. 13).

It was during this phase of the menstrual cycle that the asthmatic attacks developed, and so it appeared that the asthma might be due

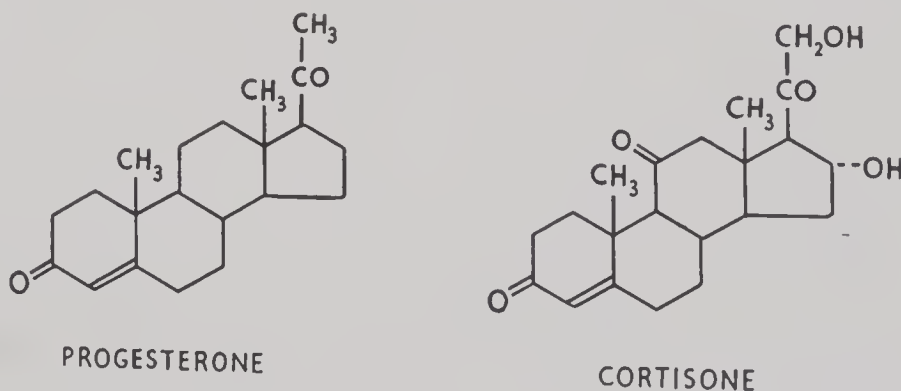


FIG. 14.

to lack of progesterone. This lack might be caused by a primary ovarian defect, or be secondary to an insufficient amount of gonadotropic luteinizing hormone which is produced in the pituitary. Further, progesterone is a steroid substance, resembling in chemical structure cortisone (see Fig. 14), which is known to relieve attacks of asthma. Small quantities of progesterone can also be obtained from the adrenal cortex. It seems, therefore, possible that progesterone may have an effect similar to cortisone in relieving or preventing bronchial spasm. The older theory that ovarian asthma is due to a nervous reflex from the ovary, is probably untrue, and should be replaced by a hormonal view of its origin.

A FATAL ERROR

A WOMAN, seventy years of age, was admitted to hospital on account of thrombo-angeitis obliterans, affecting the left leg. A year previously a lumbar sympathectomy had been performed, but without relief of the pain. A small ulcer had now developed on the leg which was very painful, and the patient's doctor wrote "Many remedies have been tried without success and twice the pain has been so severe that heroin had to be given."

I saw the lady five days after her admission, when she was still in great pain despite the administration of opiates, and advised intravenous injections of 300 c.c. of 3 per cent saline every other day. On my next visit to the hospital, three days later, I enquired after her

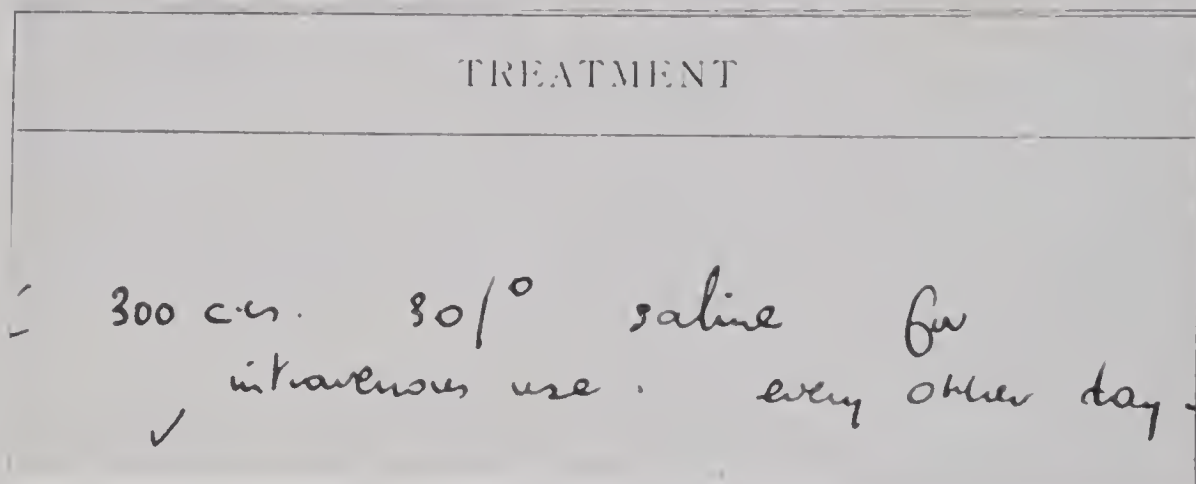


FIG 15. Photograph of prescription.

welfare, and was astonished to hear that she was dead. The house physician said that he gave the injection as I ordered, but after he had injected about 100 c.c. the patient fell back dead. Post-mortem examination revealed acute pulmonary oedema. Knowing that this treatment had been used many times before with beneficial results, I enquired what strength saline was injected, and was told "3 per cent as you ordered." Still incredulous, I asked to see the prescription sheet. On looking at it I said to the house physician "You ordered 30 per cent saline." The house physician, glancing at the sheet, answered "No, that is 3 per cent," to which I replied "Well, that is not the way I write 3 per cent." I then took the prescription to the dispensary and showed it to the dispenser. I asked him what strength solution he had sent to the ward and he told me "30 per cent, as it says on the sheet." A photographic reproduction of the prescription is given above (see Fig. 15).

THE TANGLED SKEIN

"This disease is beyond my practice."

MACBETH

1946

BEFORE seeing this patient the doctor paid me a visit to give details of her prolonged ill health over a period of fifteen years or more.

Medical histories received second-hand are usually unsatisfactory, but I was told that the lady could not bear to go all over her past illnesses again, and would only consent to see me if I did not enquire into them.

To summarize a long story, the prospective patient was thirty-eight years of age, with one daughter sixteen years old. She had not been well for at least fifteen years, and during the course of the last four years had been in eight hospitals or nursing homes, and had been seen by ten specialists. Since her childhood, which was spent in Southern Europe, diarrhœa had been a troublesome complaint. The diarrhœa became more marked about five years ago, and eventually she consulted a tropical specialist in this country, who made a diagnosis of amœbic dysentery. Many courses of emetine were given, and on several occasions the liver was needled, without any pus being discovered. Two years later Mrs. C. was placed under the care of a consulting physician, who considered her ill health was due to a calcified hydatid cyst in the liver. He found no evidence to support a diagnosis of dysentery, past or present. A year later a thoracic surgeon was called in to remove the so-called hydatid cyst, but on approaching through the diaphragmatic route he found the calcified cyst was in the right adrenal, and proceeded to extirpate it. After recovering from the operation there was no improvement in general health, in fact there was a deterioration, owing to the development of asthma, with frequent coughs and colds. About this time the patient suffered from emotional outbursts, and was taken to a psychiatrist, who attributed her troubles to chronic appendicitis. Fortunately she was not submitted to appendicectomy. The next episode was an illness which was diagnosed as meningitis, but on admission to a London hospital she was found to be suffering from mumps encephalitis.

After detailing this history, which I may say took considerably longer to relate than it has taken to write, I was told that the patient's chief symptoms now were extreme exhaustion, headaches usually accompanied by swelling of the eyes and forehead, and general fibrositic pains. She had suffered recently from two febrile attacks with sore

throat, and it was thought that some toxic process was at work, possibly due to barbiturates which she had been taking for many years.

The patient, Mrs. C., was admitted to hospital a few days later and, in accordance with my instructions, I did not question her about past illnesses, neither did she volunteer any information. She was slim, of medium height, with a delicate oval pale face, and very dark eyes and hair. I found her lying in bed in a state of extreme apathy, but from time to time she opened her large brown eyes and glanced round the room with an almost terrified expression.

There was little to be made out on clinical examination. The operation scar, where a portion of the 12th right rib had been removed posteriorly, was soundly healed, but still very tender. The heart, lungs, abdomen and central nervous system appeared to be normal. The blood pressure was 120/80 mm. Hg. The pulse was regular, 80 beats a minute. The urine contained no albumin and no sugar. The teeth appeared sound, but the tonsils looked unhealthy and the tonsillar glands were palpable.

The investigations gave normal results. They included an electrocardiogram, X-ray examination of the chest, teeth, sinuses, pelvis, and barium meal and enema. There was also a blood count, a dextrose tolerance curve, examination of a catheter specimen of the urine and determination of the sedimentation rate of the red cells. During her stay in hospital there was no diarrhoea and the motions appeared normal. Apart from an occasional rise to 99° F. or 100° F. in the evening, the temperature chart was within normal limits.

I asked an E.N.T. surgeon's opinion, and he, agreeing that the tonsils were chronically septic, removed them a few days later. After the tonsillectomy Mrs. C. complained of pains in the neck, arms and legs for a week or so. She was now becoming more accustomed to me and one day confided in me that she had suffered for years from sexual frustration, that she never obtained satisfaction at intercourse, and that she would like to see a gynæcologist. She was accordingly examined, but nothing was found wrong, and the specialist considered the symptoms to be due to the onset of the climacteric, for which he prescribed œstrogen tablets. This, needless to say, did not afford the patient much satisfaction, she wanted something more than tablets, and they certainly did not offer hope of relieving the frustration from which she had suffered for many years.

And so the investigations drew to a close, with only one abnormality found and cured, the chronic tonsillar sepsis. It seemed hardly likely that this alone had accounted for fifteen years of ill health, but there still remained the psychological disturbance and the possible barbiturate addiction. During the stay in hospital she was given either Medinal gr. 5 or three Allonal tablets, each gr. 2½, every night.

I wrote to the patient's doctor and advised continuing with the œstrogen, as ordered by the gynæcologist, for another two months. I concluded by expressing the hope that now the septic focus was removed the general condition would gradually improve. Three weeks later Mrs. C. was brought to see me and I was not surprised to hear that she was still disturbed by sexual difficulties. I advised her to see a woman gynæcologist, but she did not do so for several months. Later in the year, after two holidays by the sea, I was pleased to find considerable improvement in the physical condition. There had been a gain of 8 lb. in weight, but she was taking two or three Allonal tablets every night, which produced a good sleep of eight hours. I still considered that she was taking too much barbiturates. She said she was going on "very nicely," but then added "I feel very tense. I cannot relax. I feel too tired to do anything."

1947

Six months elapsed and we were half way through 1947 before I saw Mrs. C. again. She then told me a queer story of an accident five months previously. While having a bath she became giddy, fell backwards in the bath and crashed the back of her head. She was so disturbed by this that her general practitioner called in a psychiatrist, who admitted her to a nursing home, where she had narcosis treatment. After being laid up for nearly five months, fresh symptoms had appeared, polyuria and thirst. During the day she micturated every one or two hours and sleep was disturbed by having to pass water frequently; a fair amount being evacuated each time. Shortly after arriving at my consulting rooms she passed 24 oz. of pale urine, with a sp. gr. of 1.002, and half an hour later another 4 oz. were evacuated. The urine contained no albumin and no sugar. The condition was clearly very suggestive of diabetes insipidus. Barbiturates were still being taken; Medinal gr. $7\frac{1}{2}$ at night and various tablets to relieve pains in the neck and shoulders.

A month later Mrs. C. reported to me that she had noticed intermittent swelling of both ankles, with dreadful headaches accompanied by diarrhœa. In the meanwhile she had consulted a woman gynæcologist who had fitted a birth control apparatus. The thirst and polyuria continued unabated. I felt convinced that a fresh disease was now showing itself, diabetes insipidus, and I advised her doctor to give a weekly intramuscular injection of pitressin tannate, 1 c.c., and see whether it produced a reduction in the frequency of micturition and urine output during the following twenty-four hours.

Six weeks later, early in September, Mrs. C. reported to me that she had been feeling very much better. The frequency of micturition was much less for twenty-four hours after the weekly pitressin injection.

She had also noticed that the frequency was less before each period. The blood pressure had risen, however, to 154/100 mm. Hg., and I wondered whether this was due to the pituitrin injections or to pituitary disturbance. After a holiday abroad I was again consulted early in November. The frequency of micturition, by day and by night, had now returned, as the pitressin injections had been discontinued. The blood pressure had fallen to normal, 128/80 mm. Hg., although there was clinical evidence of disturbance of water and probably of mineral metabolism, as evidenced by periodical swelling of the eyelids and legs, cramps in the legs, abdominal distension and diarrhœa. The psychiatrist, whom she continued to attend, reported that she was becoming more tense again, and the problem of sexual intimacy had only shown moderate improvement, the co-operation of the husband not proving very satisfactory. And so ended, with the development of what appeared to be diabetes insipidus, another year. There was much cause for reflection and much that was veiled. What was the true history of the blow on the back of the head? Had the diabetes insipidus followed this, or was it a sequel of the mumps encephalitis?

1948

The year was only four days old when I was asked to see Mrs. C. again. She was still complaining of cramps in the legs, swelling of the face and hands, polyuria, thirst and attacks of diarrhœa. The injections of pitressin tannate undoubtedly controlled the urine output, for according to the patient's measurements, the average fluid intake was $7\frac{1}{2}$ pints and output $9\frac{1}{2}$ pints, but for the twenty-four hours after the pituitrin injection the intake fell to $5\frac{1}{2}$ pints and the output to 2 pints. This sounded good but, most unfortunately, the injections upset the patient very considerably, so much so that she could not continue with them. She described the reaction to the pituitrin as a blurring headache, a feeling of great pressure in the head, especially behind the eyes, and nausea.

I advised Mrs. C. to come into hospital again to try and find out the cause of the urinary symptoms.

X-ray examination of the skull showed no abnormality of the pituitary fossa. The average fluid intake was 180 oz. in twenty-four hours, the urine excretion averaging 198 oz., with a sp. gr. of 1.004. The urine contained no abnormal constituents. After injection of 0.5 c.c. pitressin the intake fell to 94 oz. and the output to 68 oz. The mouth was also moist for a short time after the injection. There was therefore no doubt that pituitrin controlled the excessive urine output, and injections of distilled water, given unknown to the patient and under exactly similar conditions to the pituitrin, had no effect on the urinary excretion. Pituitrin snuff could not be tolerated as it

caused intensely unpleasant local sensations, and pitressin tannate resulted in the general reactions described above, and so could only be given from time to time.

There was now also a definite anæmia, the blood count being red cells 4·5 millions per c.mm., Hb. 62 per cent, C.I. 0·7, white cells 7,000 per c.mm. Differential count normal. The sedimentation rate of the red cells was also normal.

There seemed no doubt that Mrs. C. was suffering from diabetes insipidus, for which no cause was found. It was presumably due to a disturbance of the pituitary or hypothalamus, and owing to the unfavourable reaction to pitressin tannate there appeared no probability of bringing it under control. The occult blood test on the fæces was negative, and no cause was discovered for the hypochromic anæmia. In this unsatisfactory state Mrs. C. left hospital early in March, and consulted me again a month later.

The polyuria was not quite so marked, the average output being about 5 pints in the twenty-four hours, without any further pituitrin injections. Mrs. C. said to me "I want to feel human. I never feel well. My legs and arms ache and I cannot stand for very long. I am just a mass of misery." She certainly looked ill and unhappy, and I found that the blood pressure had risen to 158/100 mm. Hg.

A few weeks later a fresh symptom appeared which was destined to give rise to much trouble later, noises in the head. At first they were described as being in the head and not in the ear, but later they were referred to the left ear. The anæmia in the meanwhile had improved with the administration of iron, the red cells being 4·7 millions per c.mm., and Hb. 83 per cent. During the year Mrs. C. was still taking barbiturates by day and at night, and was still being treated by the psychiatrist, and he reported to me that he was doing his best to improve her emotional state. And so the year ended without any hope of recovery, and with the diagnosis of diabetes insipidus fairly definitely established. During the three years that I had been studying the patient she did not appear to me to be neurotic, and an organic basis could be found to account for the majority of the symptoms, but behind all was the question of the barbiturates and the possible domestic incompatibility.

1949

The symptoms of diabetes insipidus were once more very distressing, and early in the year further attempts were made to resume the injections of pitressin tannate at intervals of seven to ten days. The urine output was satisfactorily reduced to 2 pints in the twenty-four hours following each injection, but the general reactions described above became so severe that Mrs. C. found them intolerable. Reduction of

the amount of the injection abolished the reactions, but it also resulted in an absence of anti-diuretic effect.

About this time a fresh symptom appeared, a distressing sensation that the brain was in a fog and a complete inability to concentrate, suggesting the possibility of cerebral œdema. The blood pressure also rose to 160/90 mm. Hg. We now tried the effect of injecting a watery solution of pitressin, but this was even more disastrous, for within a few minutes the patient's complexion assumed a pale green hue, and

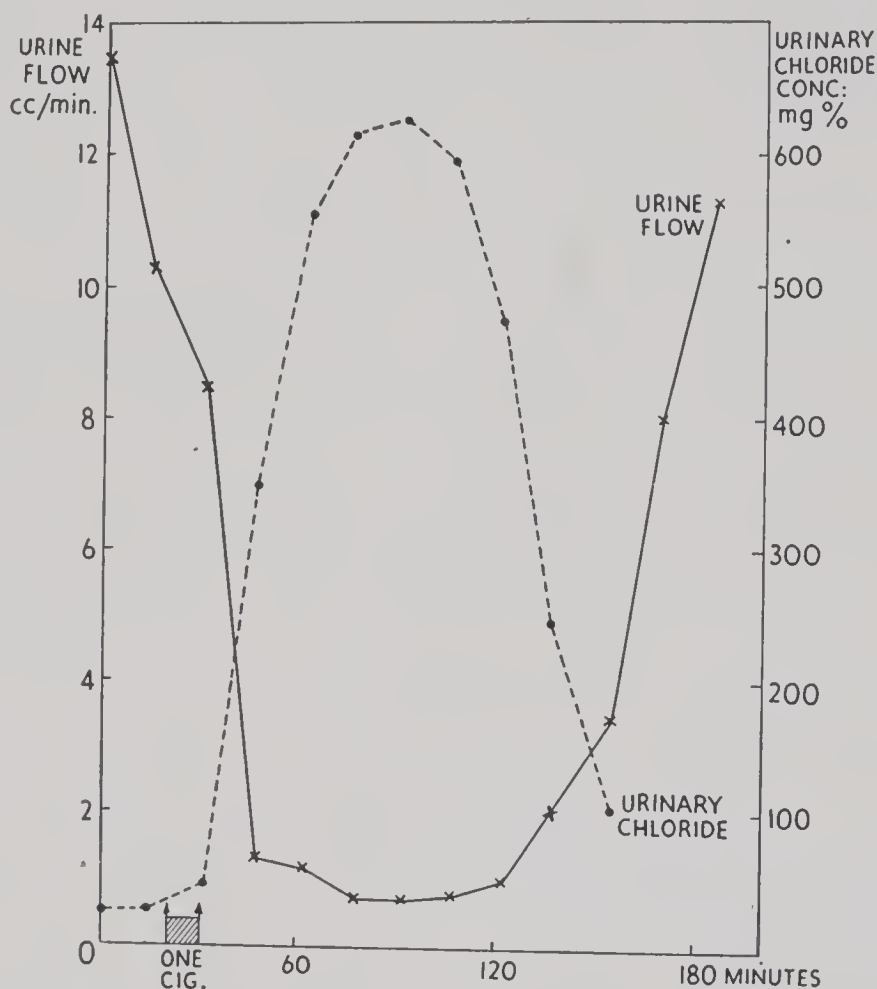


FIG. 16. Smoking Test. Effect of inhalation of the smoke from one cigarette upon urinary output and urinary chloride concentration.

two minutes later she complained of acute abdominal pain, cramps in the legs, and these were rapidly followed by profuse diarrhœa. Pitressin certainly appeared too dangerous to use, despite its very satisfactory anti-diuretic effect.

We next toyed with the idea that the diabetes insipidus might be secondary to a sphenoidal sinus infection, as I had had such a case under my care a few years previously, but investigations by an E.N.T. specialist failed to reveal any evidence of such a lesion.

During the late summer Mrs. C. went abroad for a holiday, which unfortunately also proved a failure. She spent most of the time in

bed with a temperature, headache, diarrhœa, blood and mucus being passed in the motions. On her return she looked very ill, pale and haggard, and was still running a slight evening temperature, although the diarrhœa had ceased. In addition, she complained of thirst, polyuria, noises in the head and left ear, and aching and cramps in the legs. And so I advised admission to hospital again. We now carried out the nicotine test for diabetes insipidus. Nicotine has the power of causing liberation of the anti-diuretic hormone from the neuro-hypophysis, and it is believed that this hormone is identical with vasopressin. Vasopressin, when released into the blood stream, affects the fluid concentration of urine in the distal tubule of Henle's loop in the kidney. The patient was made to inhale the smoke of one cigarette, when a normal pituitary anti-diuretic response was obtained, the volume of urine decreasing and the specific gravity and chloride content rising, which indicated that the supraoptico-hypophyseal system was intact, and not destroyed by some disease process (see Fig. 16). We were now able to obtain a French preparation of pitressin, Post-Hyposan, which is slowly absorbed. This produced a satisfactory anti-diuretic response without any distressing reactions. When Mrs. C. left hospital towards the end of the year, the fluid intake and output were maintained at about 80 oz. in the twenty-four hours, and so the year ended on a much more favourable note and we were very hopeful of having achieved a permanent improvement.

1950

The improvement was well maintained throughout January, and when I next saw Mrs. C. towards the end of the month, the diabetes insipidus was still satisfactorily controlled. But, unfortunately, a day later there was a relapse, with severe headache, giddiness, swelling of the face, nausea and vomiting. Owing to difficulties in obtaining the Post-Hyposan, it was necessary to use a different French pituitary preparation, which proved quite ineffective, for the symptoms of diabetes insipidus were now as severe as they had ever been. However, in a few weeks a further supply of Post-Hyposan was available and the thirst and polyuria were once again brought under control.

The noises in the head were now increasing in intensity and becoming almost unbearable, so much so, that from time to time, Mrs. C. indulged in attacks of crying and howling. And so for the fourth time I advised admission to hospital, where a further series of investigations were carried out.

Electro-encephalogram: Slight abnormalities of doubtful significance. *X-ray of skull:* Normal. *X-ray of internal auditory meatuses:* Normal. *Caloric tests:* Normal. *Neurologist's report:* "The diabetes insipidus is probably due to the encephalitis, accentuated by the head

injury. The tinnitus and giddiness are likely to result from degenerative vascular changes. There are no abnormal signs in the central nervous system." The treatment recommended consisted in the administration of Sodium Amytal gr. 2 t.d.s., Benzedrine mg. 10, morning and noon, nicotinic acid mg. 100 t.d.s., and Cyclobarbitone gr. 3 tab., two tablets, *nocte*. The neurologist advised that, if there was no improvement, the question of rostral leucotomy would have to be considered, as the patient was reacting so badly to her symptoms.

About two weeks after leaving hospital Mrs. C. consulted me again. The urinary symptoms were still well controlled, but she was pale and tremulous, and said, "I feel pretty grim. I have dreadful headaches and I never lose the noises in my ear." She was to see the neurologist again in a few days, and having been told that leucotomy was a drastic operation, she wanted to know what this meant. She feared it would make her go mad. I answered that the operation was designed to remove any pressure which might be causing her symptoms.

The neurologist advised in favour of the operation, but not immediately. A month later the neurologist reported to me that Mrs. C.'s condition was deteriorating, and that he was arranging now for her admission to hospital. I had no experience of this operation and was very anxious about the result, but the symptoms were now so distressing and so intractable that I felt it was justifiable to acquiesce.

Rostral leucotomy consists in turning down a scalp flap, removing a circular disc of bone, about 1 in. in diameter, on each side from the frontal bone, and then undercutting areas 9 and 10 in the frontal lobe. The discs of bone are subsequently replaced to prevent the scalp falling in.

All barbiturates were discontinued before the operation. The day after the operation the house physician considered it had been successful in removing the anxiety and depression, and the buzzing noises in the left ear were not so troublesome. The next day alarming symptoms appeared. The nurse reported that the patient had been very peculiar in the morning. She did not appear to know where she was, and insisted that there was glass in her bed, so much so that the bottom sheet had to be changed. She was extremely agitated both mentally and physically and attempted to strangle the nurse. The neurologist was sent for and Mrs. C. kept repeating to him that there was machinery in her pillow and that I had never let her down before, to which he replied that I had arranged for the machinery to be removed. The patient was in a state of excited delirium with hallucinations and hyperkinesis. There was incontinence of urine, but not of fæces, the temperature was 99° F., but no signs of meningitis or of cerebral hæmorrhage were found. The neurologist told me that he had never seen such a reaction after a leucotomy. I was asked to see the patient

in the afternoon and found her very restless, continuously twitching her face and blowing her nose very violently. All the time she muttered and rambled in her speech, and it was difficult to follow clearly what she was saying, but here are some of her remarks as they poured out in an almost continuous stream.

"They have made me just like an animal. I am so dirty and messy. I cannot stand it. Oh, please let me have a little rest. Keep on going round and round. I have to do it when I am like this. Oh, oh, that electrical business and this jiggering up. I don't want it any more. I cannot stand it any more." Her breathing now became sighing and she moved her head spasmodically from side to side, at times blowing her nose violently. "Oh, dear, all those awful black men. Oh, don't." Now she cried out loudly, "Don't let me think about it. Oh, it is horrible. Oh, dear. It ought not to be allowed—so degrading for a human being. Oh, dear—I can't. To see such an exhibition."

Now she turned her head from side to side, talking and mumbling very rapidly, she cried and put both hands to her face and eyes. Her lips moved rapidly and twitched. "I don't know one day from another. I don't know the time of day. Oh, it's terrible. I can't really think clearly. That's the trouble. Exhibition." She cried and bit her lips. There was much rapid talking, but the words were unintelligible. I gathered she was saying, "Even my handkerchief." She blew her nose violently again. "Oh, it's a valuable handkerchief." She twitched her lips and put her handkerchief to her eyes. I asked her about the noises and she answered, "Terrible. Always something put in the moment the light is put out. It's very good. He took me in, nearly." There were continuous movements of the arms and face, the breathing was sighing. "There's someone at the window now. They have to keep the curtains drawn always. Oh, please, I don't want anyone at the window. So many people. Oh, oh, so right away. I can't, oh."

And so I left her, horrified at this appalling sight of a human being I had known for several years, apparently reduced to the state of a raving animal, herself knowing that she had sunk to this level and was no longer human, and terrified by the thought of it. If this is the result of leucotomy, I thought, it shall never again be done on one of my patients.

Next day I visited her at noon with the neurologist, and to my great relief found a complete transformation. The patient, to all intents and purposes, was completely normal, feeling much better and making no reference to yesterday's events. She appeared a perfectly sane human being, although talking a little rapidly. She made no reference to the head noises and we carefully refrained from asking about them.

The neurologist subsequently told me that he considered all the symptoms were due to a drug withdrawal reaction, and that he calculated she had been taking, on an average, gr. 20 of various barbiturates daily for several months. He prescribed Sodium Amytal gr. 1 t.d.s., and Tuinal gr. 1½ at night, if necessary, to procure sleep.

Ten days later Mr. C. said that he considered his wife's disposition had changed. She was now more self-assertive, more at ease, and very easily annoyed. The noises were still there but did not worry her. When I paid my next visit I found her sitting up in bed, looking quite cheerful and smiling. I said "How are you?" "Oh, I don't know," she replied, "all right. I still have the noises," and then she laughed. I said, "You are much better than when you came in." "I don't remember," she answered, "what I was like when I came in. It is all a blur. I still get headaches."

The Post-Hyposan had been substituted by water injections for a few days, but the urine output quickly rose from 60 oz. to 110 oz. in the twenty-four hours, and the pituitary injections were then given again. Six weeks later Mrs. C. came to see me, and this was her report: "I feel rocky. I have no drive, no go. I am quite inert. It is dreadful. I do not concentrate very well, in fact I do not think I can concentrate at all. It is terrible. I still have the noises—I hesitate to say that (laughing) and it bothers me terribly. I have had some terrible headaches, a shocking pain in my head. I am always in a muddle. I do not go out." She then went on to say, "My eyes are very bad indeed. They ache and I cannot bear the light. I keep my curtains drawn in my room. My stomach swells up, I know this sounds ridiculous, but it is really worse than this, as I cannot wear my clothes. All my old complaints about tiredness just fade into nothing compared with this. I cannot read a book now. My limbs feel like lead. I have not the mental power to move them. I am sleeping badly and have most ghastly nightmares."

And so ended this most eventful year.

1951

The year appeared to open more propitiously, and I was not asked to see the patient again for the first eight months. However, the anæmia was now more marked and was becoming an important feature. The red cells numbered 3·5 millions per c.mm., and, despite intensive treatment with Fersolate, folic acid and proteolysed liver, the count remained unaltered. I suggested intravenous injections of Ferrivenin, but owing to technical difficulty with the veins, these could not be given.

Mrs. C. appeared to remain in comparatively good health until going abroad for a holiday in the summer. On the journey her feet and legs swelled considerably, and while away she had a bad attack of

vomiting. When I saw her at the end of August the psychiatrist reported, "She is doing as well as we can expect following the leucotomy, but of course she is not a well woman. However, I think she is able to accept the situation better now." The blood count had not improved; Red cells 3.3 millions per c.mm., Hb. 75 per cent, C.I. 1.1. Mrs. C. said to me, "I am not very good. I just creep about. I feel wretched and very short of breath. My legs ache." There were no complaints of the head noises, and so perhaps the leucotomy had been worth while. I arranged for a course of Ferrivenin injections to be given at hospital, and after five doses the Hb. rose to 86 per cent.

1952

After a few more injections of Ferrivenin the Hb reached 92 per cent with a normal packed cell volume and mean corpuscular hæmoglobin concentration. The blood showed no abnormality beyond a mild hypochromia. I did not see the patient for five months when the general practitioner told me that the local pathologist now considered that she was suffering from pernicious anæmia, as the blood film was megalocytic, the colour index above unity, and the hæmoglobin 75 per cent. I replied that I thought this was unlikely as with Ferrivenin the hæmoglobin had been raised to 92 per cent, no response having been obtained with folic acid, proteolysed liver or injections of vitamin B₁₂, which were given during the previous year. When Mrs. C. came to see me at the end of May she said, "During the last year or so I seem to have changed. I just go on from day to day. My memory is not very good, this bothers me. I do not laugh very much. I used to laugh a lot. I have lost my sense of humour, owing to the monotony of continuous ill-health." She looked pale and tired, but made no complaints of head noises or of urinary symptoms. The Post-Hyposan injections were still being given, but not very regularly. Three months later the hæmoglobin fell to 60 per cent with red cells 3.1 millions per c.mm., and C.I. 0.9, despite intensive treatment with liver injections. The amount of sedatives now being taken was very excessive, one Cyclobarbitone tablet, gr. 3, and one Carbrital capsule, gr. 5½, every night, Amytal gr. 1 five times a day, and seven Nembudeine tablets, each gr. 7½, a day. I advised having the fæces examined for occult blood. These tests proved negative and there appeared little hope of curing the anæmia which had been the most prominent feature of the illness during the last two years. Again I suggested to the doctor that the large amount of barbiturates might have interfered either with the absorption of iron or with its utilization after absorption into the portal circulation. The iron proved effective when introduced into the systemic circulation, so the fault possibly lay in the liver.

1953

I heard no more until the spring when I was asked to see Mrs. C. in a nursing home, where she had been for several weeks under the care of the psychiatrist. She had been admitted there with a view to cutting down the barbiturates and I was called in on account of severe abdominal pain, which was, I think, due to spasticity of the colon. With a belladonna mixture and liquid paraffin this was quickly relieved. While in this home she had an extremely terrifying experience, her bed catching fire during the night, due to a defect in the electric wiring. I advised her to return home in a few days, which she wanted to do, as the only change which had been effected in the barbiturate consumption was to replace the old drugs by new ones.

Four months later the general practitioner called a surgeon out as he feared she was suffering from intestinal obstruction, but fortunately it proved only to be another attack of spasticity of the colon.

In August Mrs. C. had what she described as a "nightmare" week-end. She had a "fiendish journey" by car, having her bowels opened several times by the road side and being doubled up by pain, the diarrhoea and pain continuing all the week-end. At other times the bowels were not opened for days. She was now taking Gardenal by day and Carbrital by night. I advised omitting the Gardenal and taking Belladenal tablets, 1 t.d.s. She told me on her next visit "I feel more than a criminal taking all this barbiturate, I have never wanted to take the barbiturates, I have only done so on doctor's orders. I would never now live down the fact that I have taken barbiturates, even if I did get off them," and then she added, "Life is so long, it just goes on and on."

Six weeks later, early in October, I saw her for the last time at my consulting rooms. In some ways she seemed better. She had been doing more in the house, and had been out walking a little and out in the car. As the result of standing her ankles were very swollen. She was still taking Gardenal and Carbrital. She was sweating a lot in bed and finding difficulty in breathing through her nose at night. The blood pressure had risen to 200/100 mm. Hg. For the first time I found the urine contained sugar—a thick orange reduction with Benedict's solution. There was no albumin. I regarded the rise of blood pressure as a very grave omen, and the glycosuria was a complicating and unexplained feature. Sugar was never subsequently found in the urine and I wondered whether it had been intentionally added to the specimen.

Mrs. C. was admitted for the sixth and last time to hospital under my care in mid-November. She had become rapidly worse, with swelling of the face and shortness of breath. Her face was moon-

shaped and the appearance resembled that met with in cases of over-dosage with cortisone. The breath smelt strongly of acetone. The temperature, pulse and respirations were normal. The urine output was 60–80 oz. in the twenty-four hours, and the urine contained no albumin and no sugar, with a sp. gr. of 1·010. The deposit of a catheter specimen contained no casts, but there were profuse pus cells and a scanty growth of *Bact. coli*. The blood pressure was 170/90 mm. Hg. There was a severe anæmia, red cells 1·53 millions per c.mm., Hb. 35 per cent, C.I. 1·1, reticulocytes 8 per cent. Macrocytosis. White cells 7,000 per c.mm., polymorphs. 82 per cent, lymphocytes 10 per cent, monocytes 7 per cent, eosinophils 1 per cent. Platelets 250,000 per c.mm. Direct Coombs' test, negative. Nucleated red cells 1 per 100 leucocytes. The bone-marrow was thus pouring out immature red cells into the circulation. The plasma proteins were normal, but the blood urea was much raised, 310 mg./100 c.c.

There was no doubt, therefore, that the patient was suffering from uræmia, and in view of the absence of albumin and casts from the urine it appeared probable that it was pre-renal in origin. The severe anæmia was not due to intestinal hæmorrhage as shown by negative occult blood tests. Was the anæmia hepatic in origin, due to liver failure, and would this also account for the nitrogen retention? The smell of acetone in the breath supported this view. A blood transfusion of 4 pints raised the hæmoglobin to 62 per cent. Five days after admission the uræmic symptoms became more severe, with vomiting of bile-stained fluid, frontal headache, hiccough, twitching of the left side of the face and of the hands. There was also slight dyspnœa at rest. Mrs. C., in answer to my questions said, "I feel quite ill, great pain, my head is very bad, and my legs and feet right up to my thighs. I cannot get comfortable anywhere." There was now a thick yellowish-white fur on the tremulous tongue.

I called in another physician and he suggested the possibility of pyelonephritis, nephrocalcinosis or renal necrotizing papillitis. The patient now rapidly deteriorated, further examinations showed a low alkali reserve, 4 mEq/L (normal 24–25 mEq/L), a high serum potassium, 7·1 mEq/L (normal 4·4–5·6 mEq/L), a low serum sodium, 124 mEq/L (normal 139–150 mEq/L) and a high plasma phosphate, 10 mg. per 100 c.c. (normal 2–4·5 mg./100 c.c.). The serum calcium was below normal, 8·6 mg./100 c.c. (normal 9–11 mg./100 c.c.). Steps were taken to correct the acidosis and restore the electrolytic balance. An intravenous injection of 10 c.c. of 10 per cent calcium gluconate was given and citrated milk and glucose by mouth, the volume of the fluid intake being limited to that of the previous day's urinary output, plus 1 litre. Sodium bicarbonate was administered by mouth, gr. 60 four hourly, with sodium citrate gr. 60 four

hourly. The amount of sodium citrate or sodium bicarbonate necessary to correct the blood sodium and alkali reserve was calculated to be between 2 and 3 oz. A direct X-ray of the abdomen, taken in bed, showed no evidence of renal calcinosis and X-ray of the bones showed no evidence of decalcification.

The next day the patient was very much worse. She could not answer my questions, although trying to do so. She could only make a few unintelligible sounds. The respirations had dropped to 12 a minute, and were slow, deep and sighing. I still could find no evidence of a primary renal lesion, and considered the condition to be one of hepato-renal failure. Necrotizing papillitis was first described by Friedreich in 1877 (1). The condition is associated with diabetes mellitus in two-thirds of the cases. In the remainder there is usually obstruction of the urinary tract. There is often an ascending pyelonephritis. Necrotic foci are sharply limited to the pyramids of the kidney, and clinically the disease has a sudden onset with fever, leucocytosis, pyuria and often hæmaturia. I could find no evidence to support such a diagnosis in this case.

Two days later there was some improvement. The swelling of the face was less noticeable and the breathing was normal. When I asked, "Have you any headache?" she did not answer, but nodded her head up and down. The blood urea, however, warned us not to entertain any false hopes, for it had risen to 520 mg./100 c.c., despite the alkali reserve being now 16 mEq/L, serum potassium 5.4 mEq/L, and serum sodium 136 mEq/L. The plasma phosphate had risen, however, to 13 mg./100 c.c.

The next day the serum calcium had fallen to 7.1 mg./100 c.c. and the patient was having convulsions. During this day she passed no urine, but 66 oz. were removed by catheter, so there was no failure of renal excretion.

I saw the patient for the last time the next evening. She was lying on her right side, which was her usual position, but from time to time turned her head upwards and to the left, wrinkling her forehead so that vertical lines appeared above her nose, which gave her the appearance of being scared. She looked at me as if she knew me. Was she afraid, and if so, did she fear further convulsions or did she fear dying?

Early next morning she was carried over to the silent shore.

Comment. Chronic barbiturate poisoning is, I think, the most likely explanation of many of the symptoms in this case and of the terminal illness. Death from hepato-renal failure due to the administration of large doses of barbiturates to a soldier on account of an anxiety state was described by Barclay and Cooke (2) in 1945. In this case the red cells fell to 2.7 millions per 100 c.mm., the Hb. to 54 per cent. Acetone was smelt in the breath and there was acidosis with an

alkali reserve of 36 c.c. CO₂ per cent and a blood urea content of 300 mg./100 c.c. The bilirubin content rose to 10 mg./100 c.c. Further, there was blood and mucus in the motions. Albuminuria is not necessarily present in cases of hepato-renal failure.

The blood bilirubin content was not estimated in the case I have described, the skin was sallow but not definitely jaundiced.

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BILE PERITONITIS

A WIDOW, sixty-five years of age, had suffered for the past seven weeks from severe attacks of abdominal pain, followed by nausea and vomiting. The vomiting relieved the pain, but the attacks recurred nearly every day. The vomit contained food, but no blood. The conjunctivæ were slightly icteric, the urine was deep orange in colour and contained bilirubin. The liver was enlarged about 2 in. below the right costal margin, and was tender, the maximum tenderness being just below the xiphoid. The pain went through to the back, in the mid-line at the level of the sixth dorsal spine. The gall-bladder could not be felt. On admission to hospital the temperature was found to be raised to between 99° and 100° F., and it seemed probable that the patient was suffering from recurrent attacks of biliary colic. There was excess of bile pigment in the blood, the icterus index being 24 units (normal 4–6 units) and the quantitative van den Bergh test gave a reading of 3·7 mg. bilirubin per 100 c.c. (normal 0·1–0·8 mg./100 c.c.). During the next two days in hospital the temperature rose to 101° F. in the evening, and a swelling was felt in the abdomen which was thought to be the gall-bladder. The attacks of pain continued, and between the attacks the abdomen became more distended and swollen. On the third morning there was a very noticeable deterioration in the patient's condition. The abdominal pain had become more generalized, there was guarding over the right upper quadrant, and by now the temperature had fallen to normal. The blood showed no leucocytosis, the white cells numbering 6,900 per c.mm., with polymorphs. 81 per cent, lymphocytes 13 per cent, and monocytes 6 per cent. Intestinal movements could be heard on auscultation of the abdomen, and a "straight" X-ray examination of the abdomen showed the shadows of gall-stones, but no fluid levels were demonstrated in the intestines. The pulse rate had risen from 80 to 100 a minute, and the blood pressure fallen from 150/90 to 115/75 mm. Hg. During the afternoon the pulse rate rose a little, and no bowel sounds were audible. The abdomen was now distended, rigid, tender all over and there was slight dullness in the right flank. A surgeon considered it probable that the gall-bladder had ruptured and that there was an associated peritonitis. It was recognized that an operation was extremely hazardous, but that it probably offered the only hope of saving the patient's life. Unfortunately death occurred during the administration of the anæsthetic.

The post-mortem examination revealed that the distension of the abdomen was due to dilated coils of intestine. Heavily bile-stained

fluid was present in the abdominal cavity. The liver was enlarged and fatty, the gall-bladder was distended and contained small calculi, and a stone the size of a pea-nut was found in the ampulla of Vater. The gall-bladder contained no pus, and the site of the biliary leak must have been very small and was not discovered. In the duodenum, about $\frac{1}{4}$ in. distal to the ampulla of Vater, an ulcer was present, adherent to the pancreas, and about $\frac{1}{3}$ in. in diameter. Alongside of the portal vessels around the foramen of Winslow, degenerated glands were present, suggesting a recent virulent infection.

Comment. There are many ways by which bile may extravasate into the peritoneal cavity. In some cases the source of the bile leak is easily found; thus the biliary effusion may follow cholecystectomy, or be due to acute cholecystitis, and necrotic lesions in the bile duct consequent on carcinoma or calculus. In other instances the actual perforation cannot be found and it may rapidly seal over. Microscopical examination of serial sections may reveal the site of the lesion. Rupture of a subserous duct on the liver surface has been shown to be one of the commonest causes of microscopical leakage of bile, usually associated with chronic cholangitis, or due to liver trauma.

The extravasation may at first be retroperitoneal, causing severe pain between the shoulder blades. When the bile exudes into the peritoneal cavity it provokes a severe peritoneal reaction, whether sterile or infected. It leads to an outflow of plasma from the peritoneal capillaries, with fall of blood pressure and symptoms of shock. The condition may simulate perforation of a peptic ulcer, peritonitis secondary to a perforated appendix, or the onset may be more gradual with abdominal distension and vomiting. If the bile is not infected there is often a remission of symptoms after the first acute attack. The mortality in cases of bile peritonitis is high, 60–70 per cent of cases proving fatal. Adequate drainage, followed by blood transfusion, affords the best hope of recovery. The reader will find interesting accounts of the condition in the references given below.

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THE CONSULTANTS' DILEMMA

"There are many events in the womb of time which will be delivered."

OTHELLO

CONSULTING physicians are occasionally faced by what appears to be an almost insoluble problem in diagnosis, even although facilities are available for any pathological or radiological investigation which may be thought necessary.

In the summer of 1952 I was called to a case of this nature. The patient, a man fifty-seven years of age, had been admitted to a clinic for investigation. By birth an American, and by profession an engineer to an important company, his work took him to various parts of the world, including the tropics. His previous health had been excellent, and the only illnesses he could recall were dengue fever several years ago, and occasionally an infection of the maxillary antrum.

On recently arriving by air from America he had made hurried visits to several towns in England and Scotland on a business tour. On Thursday, July 10th, the engineer attended a party in the afternoon at a small town a few miles outside London, and the next day, feeling tired, went away for the week-end. Two days later, being still exhausted, he returned to London and was examined by one of the company's doctors. The patient now complained of aching all over, but there were no retro-orbital pains. The temperature was raised to 102° F. and a provisional diagnosis of *influenza* was made. Next day the temperature was 100° F. in the morning and 102° F. in the evening. No signs of disease could be found, the lungs were clear, and the heart sounds normal. The doctor empirically ordered intramuscular injections of penicillin, and chloramphenicol capsules to be taken by mouth, and this treatment was continued for the next four days. As there was still no improvement, and the temperature continued between 100° and 101° F. a consulting physician was called in. Some crepitations were now heard at the base of the left lung, and the diagnosis was changed to that of *virus pneumonia*. The penicillin injections were discontinued, but the chloramphenicol was still administered in doses of 1 G. every six hours. On the same day the patient was moved to a clinic where an X-ray film was taken of the lungs. This showed a small and indefinite shadow at the left base. Despite the chloramphenicol treatment the temperature remained raised at the same level, and now aureomycin was given in its place, in doses of 750 mg. every six hours.

The next day, July 24th, I was called in consultation. The doctor

told me the history of the case and showed me the first X-ray film of the chest and a second one taken a week later. In both films the shadow at the left base was very indefinite. I expressed the opinion that with a virus pneumonia I should have expected the X-ray findings to have been more extensive than the physical signs, whereas the reverse was the case here. The blood count was Hb. 94 per cent, white cells 4,000 per c.mm., polymorphs. 72 per cent, lymphocytes 24 per cent, monocytes 3 per cent and eosinophils 1 per cent. The patient's temperature had been gradually falling during the last four days (see Fig. 17) and was 98.8° F. when I saw him in the evening. I found him sitting up comfortably in bed, reading. He was bullet-headed and clean shaven, with rather prominent cheek bones, a sallow complexion and small bright eyes. He did not look ill. The only abnormal signs I could find were slight dullness at the base of the left lung, with air entry a little diminished and a few râles. There was a gold bridge in the upper

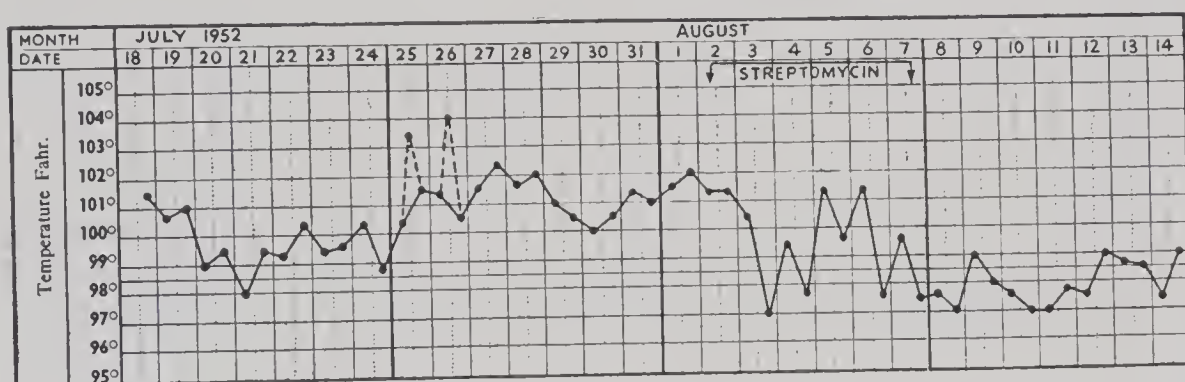


FIG. 17. Temperature Chart in The Consultants' Dilemma.

jaw and I advised having the teeth X-rayed to exclude the possibility of an apical dental infection. I made a provisional diagnosis of *acute bronchiolitis* and recommended that the aureomycin should be given for another four days, concluding that the patient was now well on the way to recovery.

This, however, was not the case, and future events showed that we were only at the beginning of our troubles. The next evening the doctor telephoned me to say that the patient's temperature had risen to 103.4° F. just after lunch, and later in the day he sweated profusely and became a little cyanosed. In view of his previous visits to the tropics I suggested that quinine should be given, in case the illness might be due to *malaria*, although there was nothing in the clinical picture which pointed to this diagnosis. It was evident that a relapse had occurred, and, as Clorin, the Holy Shepherdess, said, "Relapses are the worst disease."

The next morning I paid my second visit with the general practitioner, and found the patient still sweating profusely, which he attributed

to the quinine. The temperature had been falling since midnight, and was now 101.4° F. No rigor had been noted with the sudden rise of temperature the day before, and there was neither cough, nor pain in the chest. Finding no fresh physical signs I suggested that further laboratory tests should be made: A blood culture, examination of the blood for malarial parasites, the agglutination tests for the typhoid and dysentery groups of organisms and for the *Br. abortus*. The fæces were also to be examined for pathogenic organisms, cysts and ova, and the urine for organisms. In the meanwhile I advised that the quinine should be continued for a few more days.

Two days later the doctor telephoned me in the morning to report that the patient was no better. The temperature had risen to 104° F. after my last visit, again without a rigor or localizing signs. For the last thirty-six hours it had varied between 101° and 102° F., with respirations 30 and pulse 116 a minute. I paid another visit in the evening, when it was now evident that the case was not so simple as first appeared, and indeed, it was presenting a major diagnostic problem. The patient was sitting propped up in bed with a blanket around his shoulders. He smiled as I came in. I said, "How are you getting on? Have you any pain?" "I have some vague pains in my limbs and back on moving," he replied, "and perhaps a slight discomfort under the breast bone on breathing deeply." Once again I made a complete physical examination. The heart beat was now irregular, due to premature systoles, and a very faint systolic murmur could be heard over the pulmonary area. The air entry was still slightly diminished at the left base, and accompanied by a few râles. There was no evidence of a prostatic abscess on rectal examination. The legs and spine appeared quite normal.

The results of some of the laboratory examinations were now available. The agglutination tests and the blood culture were negative. A thin cloud of albumin was present in the urine and there were a few granular and hyaline casts. It was sterile on culture. The white cell count had risen to 11,600 per c.mm., with 86 per cent polymorphs. Beyond the evidence of some renal damage, the tests were negative and of no help in establishing the diagnosis. We decided to discontinue the quinine and try the effect of a sulphonamide drug, in the form of sulphamerazine. In view of the cardiac murmur, the sweating and the continued fever I wondered whether the patient was suffering from *infective endocarditis*, and advised that another consulting physician should be called in.

On the next day, July 29th, the consultation was held. During the night the patient had noticed a fresh symptom, a pain in the right subcostal region extending around the chest, which passed off in a few hours. The general practitioner again related the history of the case

in great detail, together with the results of the investigations. The consultant, when he heard of the pain in the right subcostal region remarked, "Has he a carbuncle of the kidney?" and I replied, "There are no organisms in the urine." After the examination he expressed his opinion in a few words. "The skin," he said, "is very hot and rather red over the back. I think that Mr. P. is suffering from *septicæmia*, and I should advise having all the pathological tests repeated in another laboratory." We then returned to the patient's room, and the consultant said to him, "You have an infection which you are dealing with very well, but we have not yet been able to track down the actual source of the infection."

The temperature was still varying between 100° and 101° F., and in view of the presence of granular casts in the urine I asked for the blood urea to be estimated to see if there was severe renal failure. This test was not, however, carried out. The blood count on July 31st was red cells 4·6 millions per c.mm., Hb. 84 per cent, C.I. 0·9, white cells 7,000 per c.mm., polymorphs. 86 per cent, lymphocytes 12·7 per cent, mononuclears 1·3 per cent. No malarial parasites were found. The fall in the white cell count was opposed to the diagnosis of a septic focus or abscess.

"When the mind is in doubt it is impelled hither and thither by slight influences," and revolving the matter in my mind I wondered whether the primary lesion might be a *basal pulmonary tuberculosis*. In view of this possibility, and as the patient was now beginning to hiccup, which suggested diaphragmatic irritation, I advised that a course of intramuscular injections of streptomycin should be given in place of the sulphonamide drug.

The evidence pointing to the lungs as the primary seat of the trouble was becoming more marked, for the alæ nasi muscles were now in action, and the breathing had a somewhat "hissing" character, suggesting respiratory embarrassment. I found, however, that the noisy breathing was due to the patient having a deflected nasal septum and to his breathing forcibly through the nose with the lips closed.

He was still sweating profusely and asked the nurse to wipe his face before I examined him. He looked now more ill, and the lips were slightly cyanosed. I found more extensive signs in the lungs, râles could now be heard in the right lung in front, just above the liver, in addition to those present at the left base. Further, an X-ray film of the chest, taken the day before, showed a few shadows in the right mid-zone, corresponding with the area where the râles could be heard. When I had completed my examination, the patient said to me, "Have you found out the source of the infection?" and when I said I was sorry I had not, he replied, "I hoped you would say 'Excelsior, we have found the cause.'" The injections of streptomycin were followed

the next morning by a fall of temperature to 100·4° F. in the morning, and to 99° F. in the evening, but the improvement only continued for a day, when the temperature again rose and the patient became more ill.

The general practitioner still favoured the diagnosis of infective endocarditis with pulmonary congestion, a view which I could not support. There was now no cardiac murmur, no enlargement of the spleen, no evidence of embolic spots in the fingers, and the complexion had not a *café-au-lait* tinge. The doctor, who was going away for the Bank Holiday week-end, asked if I would take charge of the patient for a few days. I willingly accepted as I felt it would give me an opportunity of studying this difficult diagnostic problem more closely. And as it happened events occurred during this week-end which, if properly interpreted, would have solved the mystery.

Early next morning, while I was still asleep, the nurse at the clinic telephoned me to say that the patient was very ill indeed, sweating, cold and cyanosed. The pulse was rapid, feeble, irregular and almost uncountable, the respirations over 40 a minute and the temperature 101·2° F. I told her to continue giving oxygen, and, when I arrived at the bedside about twenty minutes later, I found him considerably better. He was propped up in bed, sweating profusely, the complexion rather more sallow than usual, yet with a slight pink tinge in the cheeks and lips. As I came in he smiled at me. I said, "How are you now?" and he replied, "Very weak." The pulse was feeble, but could be counted, the heart was fibrillating, with an apex rate of 144 a minute. The pulmonary second sound was markedly accentuated and a systolic murmur was audible over the pulmonary area. There were many râles in the right lung in the mid-axillary region, and in front above the liver. There was no friction rub. I sat by the bedside and wrote out the treatment, Coramine injections and digitalis by mouth, and as I did so the patient looked out of the window, saw the sun shining, and said, "It is a nice day." I failed, however, to make the correct diagnosis of the cause of the cardiac attack, and possibly of the whole illness. I wrote in my notes, "Has he acute tuberculosis, infective endocarditis or septicæmia?" but none of these suggestions was correct.

During the afternoon another of the doctors connected with the patient's company in London telephoned me to say that a cable had been received from America, requesting that an eminent cardiologist should be called in, and it was left to me to make the choice. I was fortunate in being able to arrange for the consultation to take place the same evening at 6 p.m. The patient was now much better than when I visited him in the morning, but he looked very tired and weak, as if recovering from a severe shock. The *alæ nasi* muscles were still in action, but there was no longer visible sweating. The temperature

had fallen to 98° F., but the heart was still fibrillating, with an apex rate of 140 and respirations of 45 a minute. There was no pain, no cough and no expectoration. The cardiologist made a very complete examination and remarked that there was no swelling and no tenderness of the legs. After returning to another room he delivered his verdict. "There is no evidence of bacterial endocarditis, there are now no cardiac murmurs, and the fact that the heart is fibrillating almost excludes the possibility of bacterial endocarditis." He concluded that the patient was suffering from *acute bronchiolitis with a secondary myocarditis and auricular fibrillation*, and so we now reverted to my original diagnosis.

Early the next morning I visited the patient to find further improvement. The temperature was 99·8° F., the apex rate 120, regular, and the respirations 40 a minute. The breathing was shallow, expiration being a little prolonged, and râles were heard, as before, in both lungs. There was again profuse sweating, but no cyanosis. In the evening the heart was once more fibrillating, but the temperature had fallen to 97·6° F. and the patient appeared better. I found him propped up in bed reading the paper, which reminded me of a favourite saying of my chief when I was a house surgeon at the Middlesex Hospital—"to find a patient reading the paper after a severe illness is a good sign of recovery." There are also other signs of convalescence. You have probably all met with the patronizing type of patient who, when he is desperately ill, greets you in a whisper as "My dearest friend." As he improves and his voice strengthens he welcomes you with a "My dear Smith," and when convalescence is established your presence is acknowledged with a "Good morning, Dr. Smith."

On August 5th I found a new nurse in attendance. On asking how the patient was she replied, "He has pneumonia." When I enquired how she had arrived at this diagnosis she answered "Oh, by his nose movements." That evening I visited the patient again with the general practitioner to whom I related the alarming events which had occurred during his quiet week-end. The improvement was maintained, the heart was now regular, the pulse 84, and the temperature 99·6° F. The patient said he felt weak, but had no pain.

I heard no more until just after lunch on August 7th when I was sent for urgently, as the nurse could not get in touch with the general practitioner. She told me that the patient was again desperately ill and very collapsed. The attack came on quite suddenly at 2 p.m. I left everything and arrived at the clinic in a few minutes. The patient was semi-conscious and did not appear to recognize me, the pulse was feeble and rapid, but after an injection of Coramine there was some improvement. During the afternoon the practitioner telephoned me and said that he was calling in a young consultant who had "the

reputation of pulling a difficult diagnosis out of the fire,' and he added that he would be pleased if I would join them that evening. I readily agreed as I was naturally eager to meet this diagnostic prodigy. The consultation proved to be one that I shall never forget.

We met after tea, quite a large party. There were present the general practitioner, the young consultant, two other doctors attached to the patient's company in London, one English and one American, the patient's brother who had flown over from America, two American laymen, members of the company, and myself. The young consultant was a short, heavily built man, who had discarded the consultant's conventional sombre attire and appeared in a sports coat with a soft blue shirt and collar. We five doctors first retired to a small room, where the general practitioner again related the history of the case, and I added a few points to the story from time to time. The young consultant took no notes and made no comments. The general practitioner and the consultant then went to the patient's room, and, as it was a small room, I stayed behind and talked to the other two doctors. After about twenty minutes or so the consultant and general practitioner emerged from the patient's room, bearing a specimen of urine, which they took along the corridor to test, saying they would be back in a few minutes. On their return, the consultant, in an assured manner and without any preliminaries, announced, "He has uræmia." I was astounded to hear this diagnosis, and, perhaps looked somewhat incredulous, for the consultant turned to me and said, "He has hissing breathing, Kussmaul breathing. We should have his blood urea and alkali reserve done and then we shall know where we are." The patient's friends appeared delighted that at last the cause of the illness had been discovered and a certain diagnosis made. They looked at the young consultant as if some new planet had swum into their ken. The consultant now said to me, "He has a coarse pleural rub over the lower half of his right lung in front." Knowing that this was not present when I examined the patient four hours earlier, I said nothing. The patient's brother then asked, "When can these new tests be done? Can they be done to-night? What treatment should be given now?" and the company seemed somewhat disappointed when the consultant, after some hesitation, answered, "Go on with the same treatment."

I left the consultation feeling that my star was very much in the descendant, and yet convinced that the solution to the problem had not been found, and that the diagnosis could not be uræmia. It was probable that there was a certain degree of renal failure due to deficient circulation, and that the blood urea would be found to be raised. Further, the type of breathing described by Kussmaul in 1874 (1) is known as air hunger, and was noted in patients suffering from diabetic coma. Kussmaul wrote that the dyspnœa was of an unusual kind, and

that there was no indication that the air had to overcome the slightest obstruction on its way into or out of the lungs. There was tremendous activity of the respiratory muscles as contrasted with the extreme weakness of the skeletal muscles elsewhere. There was no real stridor, and no whistling such as is met with in stenosis of the larynx or trachea. On the contrary, the expiratory sounds were often groaning. Professor Adolph Kussmaul's name is somewhat strange, meaning as it does, "kiss mouth" (see Fig. 18). Kussmaul was Professor of Medicine at Heidelberg, and in 1859 went to the University of Erlanger. At his first lecture there he introduced himself to the students by saying, "Gentlemen! All the suggestive jokes regarding my name have already been made. The students of Heidelberg collected them,



FIG. 18. Caricature of Professor Kussmaul. ("Frankfurter Illustrierte" (1953). 41 Jahrgang, p. 31.)

arranged according to their intensity in a stitch-book, which you can get from there for fifty pfennigs. So you can concentrate all your attention upon your studies" (2).

Addison (3) in 1868 had described "hissing" breathing in patients suffering from uræmic coma. He wrote "the stertor presents more of a hissing character, as if produced by the air, both in inspiration and in expiration, striking against the hard palate or even against the lips of the patient, rather than against the velum and throat, as in ordinary apoplectic stertor." In our case the patient was not comatose, and, as I have mentioned above, he breathed with his lips closed and the noise was produced in the nose.

On thinking over the case on my way home the heavens appeared to open and the light flashed upon me. I wrote in my notes that evening, "It seems very likely that there has been a series of pulmonary

emboli which would account for the severe collapse and cardiac attacks as the emboli passed through heart. The source of the emboli remains undiscovered, but it probably lies in deep seated veins in the legs. It is likely that they are infective, in view of the high fever in the early stages of the illness, if the onset of the illness was due to venous thrombosis and not to an acute bronchiolitis." The occurrence of the pleural friction had given the clue to the diagnosis for, as was suggested by the Faithful Shepherdess the "beating vein conveys infection dangerous to the heart."

I wondered whether I should hear any more about the case, and was glad when the general practitioner telephoned me again, late the next evening. He told me that the alkali reserve was normal, and so there was no acidosis as would be expected if the patient were suffering from uræmia. The blood urea was, however, raised to 100 mg./100 c.c. The young consultant had visited the patient in the morning and taken an electrocardiogram. This showed auricular flutter, with a 3 : 1 heart block. The apex beat was still regular. Coarse pleural friction could now be heard all over the right lung in front. The nurse, on washing the patient in the morning, had noticed œdema of the outer side of the left thigh. No enlarged veins could be felt and there was no localized tenderness, but there appeared no doubt now that there was a deep-seated venous thrombosis.

Finally, I was asked to see the patient again the next morning as I had been "so good in looking after him during the week-end." I found him looking very tired and apathetic and saying he wished to leave us. He had asked his brother to book him a passage to America. The respiration rate varied between 30 and 40 a minute, and the alæ nasi were moving less. The respiration still had a certain hissing character, which ceased directly the patient opened his mouth. The œdema of the left thigh was not very obvious, but the subcutaneous tissues felt doughy, and I found that the left calf was $\frac{1}{2}$ in. larger in circumference than the right. No veins could be seen in the lower part of the abdomen, so the thrombosis was probably not within the pelvis. The friction rub over the right lung had completely disappeared. There were numerous râles over the lower two-thirds of both lungs, back and front. The pulmonary first and second sounds were accentuated and there was again a faint pulmonary systolic murmur. The urine output was 50 oz. in the twenty-four hours, and the urine contained no albumin. The temperature was 97.2° F. I explained to the patient's brother, who was a very intelligent and understanding man, that it was now clear that the recent events were due to clots forming in the veins of the leg, which passed to the lungs, but that it was not certain whether the disease had begun with an acute infection of the small bronchial tubes, in which case clots in the veins of the legs had

resulted from the immobilization in bed. I advised treating the patient with injections of heparin followed later by Tromexan tablets by mouth.

A week elapsed before I was again called in as the temperature would not settle completely, rising occasionally at some time during the twenty-four hours to 100° F. The patient was now having no drugs except the anticoagulants and 0.25 mg. digoxin twice a day. The blood urea had fallen to 55 mg./100 c.c. The doctor said that he still felt that there was something which we had not discovered in the lungs, and suspected a *bronchial carcinoma*. He was deferring a further X-ray examination of the chest until the patient was able to stand. I, however, had little doubt that convalescence was now established. The patient was once again reading the paper, the sallow complexion was tinged with pink, the respirations were calm and silent, and a moderately full breath could be taken without any diaphragmatic catch. The cardiac impulse was forcible in the fourth and fifth left spaces in the mid-clavicular line. The heart sounds were still abnormal. The first and second sounds were accentuated at the apex and at the pulmonary base, and there was a faint pulmonary systolic murmur. The apex beat was regular, 100 a minute. Some fine râles could be heard at the base of both lungs. A thrombosed vein was palpable in the left calf, and another in the outer side of the right thigh. There was no œdema of the legs. There had been no cough and no sputum throughout the illness. The patient was still anxious to return by boat to America. He was very cheerful and said to me, "Well doc., you won't see me in alcohol after all." I was quite sure there was no bronchial carcinoma.

A week later, on August 22nd, I paid my last visit. The improvement had been maintained, the patient was now sitting in a chair and walking a little in his room. The blood urea was normal. There were still some râles at the bases of the lungs, more so on the left side. The first sound at the cardiac apex was accentuated and the second sound very weak. The pulmonary second sound was slightly accentuated. The general practitioner still, however, feared bronchial carcinoma.

The patient left the clinic on September 2nd and came to see me on September 19th. He said "I feel pretty well, doctor. I am taking breathing exercises from the physiotherapist at the clinic." He could walk about 100 yards without feeling tired. I took an X-ray film of the chest which showed both costo-phrenic angles obliterated and the scar of an infarct in the right lower zone. And so the question remains, can a cryptic thrombosis of veins in the thigh begin with high fever and pulmonary signs, or did the illness commence with a basal pulmonary infection?

During the month of September I saw, in hospital, another case of a somewhat similar nature. The patient was a man, forty-three years

of age, who was admitted for treatment of a duodenal ulcer. A week later he was suddenly seized, during the early hours of the morning, with increasing pain in the right lower chest, which became intense in the space of an hour or so. An X-ray film was taken of the chest, which showed a small shadow, suggesting an area of collapse at the right base. Soon there was muscular rigidity all over the abdomen, except in the left lower quadrant, and a diagnosis of perforation was made. The abdomen was opened eight hours after the first symptom, but nothing abnormal was found. I saw the patient for the first time a week later. He looked ill, was running a low grade fever of 99° to 100° F., and, on examination of the chest, the percussion note was impaired with weak air entry over the base of the right lung, posteriorly. I thought that he was probably suffering from an inhalation "pneumonia," with diaphragmatic pleurisy, although the pain had not been referred to the right shoulder. Two days later the patient complained of slight pain in the left calf, where there was some tenderness, but nothing abnormal could be felt, and there was no œdema. The next night, at 2.45 a.m. the house physician was called, on account of very severe pain in the lower part of the right chest, of sudden onset. The temperature, which had been normal for a few days, was raised again to 99.4° F., the pulse rate was 150, and respirations 26 a minute. There was no disturbance of cardiac rhythm and the blood pressure was 150/100 mm. Hg. The physical signs in the chest remained as before. There was slight guarding of the abdominal muscles in the right upper quadrant, and the neck was stiff on the right side. Moving the neck increased the pain in the chest. A diagnosis of pulmonary embolus was made, and the pain was relieved by an injection of morphine. At 7 a.m. the same morning there was a recurrence of the pain, but it was less severe. At mid-day the patient was being examined by the registrar; he was testing for Homans' sign (4) which consists of pain in the calf on dorsiflexion of the foot, when the patient said "I feel faint." He then asked for a bottle and expired rapidly.

The sign, which is usually known as Homans' sign, was mentioned in Homans' paper *Venous Thrombosis and Pulmonary Embolism*. He does not claim originality for it, in fact he says it was described by Conner (5) in 1940, in cases of typhoid fever. Conner "found pain and soreness on stretching of the calf muscles, a small area of tenderness or, less often, tenderness and induration about the heel and deep in the sole. Following the discovery of such signs, phlegmasia alba dolens might develop in several days to several years." Homans writes: "It cannot be too strongly emphasized that the more silent and insidious the deep thrombosis, the more dangerous it is, and the more outspoken, the less liable to cause embolism."

The post-mortem examination showed thrombosis of both femoral

veins, and ante-mortem clot could be easily expressed from them. There was patchy fibrinous exudate on the surface of the lower lobe of the right lung, overlying pulmonary infarctions. A recent pulmonary embolus was found in the main pulmonary artery, composed of a coiled ante-mortem thrombus 6 in. long. An old thrombus was impacted and organized in the lower branch of the right pulmonary artery, and peripherally there were a number of pulmonary infarcts, up to 2 in. in diameter. The oldest was probably about two weeks old. There were no infarcts in the middle or upper lobe of the right lung and none in the left lung. The small duodenal ulcer was partially healed. The heart and pericardium were normal.

This illustration therefore supports the view that the illness in the case first described began as an acute bronchiolitis, probably associated with an upper respiratory infection, as indicated by his nasal congestion and history of old antral infection. The pulmonary embolus probably first formed on July 28th when the pain occurred around the diaphragm, and the primary source of the embolus, the thrombosed veins in the leg, resulted from immobilization in bed.

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SARCOIDOSIS

“Sickness is felt, health little or not at all.”

OF MANAGING ONE'S WILL

A YOUNG married woman, twenty-seven years of age was admitted to hospital under my care in June 1953. She had been quite well until the previous November when she noticed, fairly suddenly, dryness of the mouth and an unpleasant taste. A few days later a rash appeared on the neck, trunk and arms, which spread to the legs. The rash faded in about six weeks, but did not disappear. Early in December 1952 the patient began to cough up about 2 oz. of rather thick yellowish sputum every morning, and this also persisted for about six weeks. About this time she noticed shortness of breath, palpitations, and weakness, with loss of weight. During the seven months preceding admission to hospital Mrs. P. lost nearly 2 stones in weight. Early in February 1953 a swelling appeared on each side of her face, and her brother told her that she was suffering from mumps; the swellings, however, were painless. The only other symptom noticed was soreness of the left eye.

The patient appeared healthy and there was no evidence of anæmia. No lesions were seen in the mouth. Both parotid glands were uniformly enlarged, firm, mobile and not tender. The right gland was a little larger than the left. Swollen lymphatic glands were felt in the right sub-mandibular region, in the posterior triangles of the neck, and in the groins. Both epitrochlear glands were also enlarged. The lacrymal glands were larger than normal, the conjunctiva lining the lower lids was red and thickened, there was conjunctival injection, and the left eye was less moist than the right. A papular, pink rash was visible on the arms and trunk, especially upon the back, with surrounding erythema of the skin. No abnormal signs were found in the lungs, abdomen or central nervous system. The heart was normal, and the blood-pressure 130/65 mm. Hg. The hands and feet appeared normal. The urine contained no albumin and no sugar. The ophthalmologist reported that the dryness of the left eye was due to lymphoid hyperplasia of the conjunctiva of the lower lid. There was no irido-cyclitis.

It appeared probable that the patient was suffering from sarcoidosis affecting the parotid glands, the conjunctivæ, the lymphatic glands, the skin, and possibly the lungs. X-ray examination of the chest showed evidence of gross enlargement of the glands of both hilar regions, lymph stasis of both lungs, and thickening of the fissures. The appearances suggested sarcoidosis. X-rays of the hands and feet did not show the

rounded punched out areas of the phalanges sometimes met with in sarcoidosis. This is called Jüngling's *osteitis tuberculosa multiplex cystoides*. The blood count was normal, the sedimentation rate of the red cells was 10 mm./1 hour (Westergren), and the Mantoux test was negative with a dilution of 1/100 tuberculin. The sputum contained no tubercle bacilli. The blood proteins were normal, 7.1 G. per cent with no alteration of the albumin/globulin ratio, as may occur in sarcoidosis; the figures being albumin 4.5 G., globulin 2.6 G. per cent.

The diagnosis of sarcoidosis was confirmed by a biopsy of the right epitrochlear gland which showed changes typical of the disease, nodular areas composed of masses of reticulo-endothelial cells, with some giant cells, but no caseation. During the first week in hospital the patient lost a further 5 lb. in weight, despite the fact that she was eating well.

Treatment was begun on July 7th, 50 mg. of cortisone being administered by mouth three times daily. The response was very rapid. In a few days the lassitude completely disappeared, in fact the patient volunteered the remark that she was possessed of tremendous energy. The parotid and lymphatic swellings quickly subsided, the X-ray films of the chest showed diminution of the hilar glandular shadows and clearing of the lung fields. There was a gain of weight of 8 lb. in two weeks. The patient left hospital on July 19 after taking a total of 2 G. of cortisone by mouth.

Mrs. P. was seen again nine months later; she had kept very well and gained another 19 lb. in weight, being then 12 st. 7 lb. There was no recurrence of the swellings, the eyes appeared normal, and, radiographically, the enlarged hilar shadows had disappeared and there was further clearing of the lung fields.

Comment. Sarcoidosis is a disease in which natural remissions tend to occur, these may be hastened by cortisone, or a remission may be induced by cortisone which perhaps would not have taken place apart from the administration of the drug. I have seen several similar cases in which equally favourable results have followed cortisone treatment, the patient being restored to health and able to resume his occupation, even to pass the strict medical examination imposed upon an air pilot. The favourable response to cortisone therapy constitutes a strong argument against the view, which has been held by certain writers, that sarcoidosis is tuberculous in nature.

INTERMITTENT JAUNDICE

“ Begin early to make a threefold category—clear cases, doubtful cases, mistakes. And learn to play the game fair, no self-deception, no shrinking from the truth; mercy and consideration for the other man, but none for yourself, upon whom you have to keep an incessant watch.”

COUNSELS AND IDEALS

FROM time to time a doctor, after reading one of my case descriptions, has said to me, “ I wish you would tell us about some of your mistakes,” and I had this in mind when selecting this case. I know of no other condition, which may prove more baffling, or give rise to greater difficulties in diagnosis than jaundice, and the instance I am about to describe illustrates some of these difficulties, while the final solution of the problem offers an explanation of how the mistakes arose.

The patient, a man sixty years of age, consulted me early one February on account of jaundice. He was slim of build, tall and handsome, with a shock of white hair. A great part of his life had been spent in India, where he had suffered both from amœbic and bacillary dysentery, and also from malaria. Shortly before leaving India, and seven years prior to my first consultation, Mr. M. noticed pain over the xiphoid cartilage, usually brought on by walking up a hill, and quickly disappearing when he stopped walking. Electrocardiograms taken in India and on arrival in England, revealed no abnormality, and since returning home the effort pain was no longer noticed.

The illness for which I was consulted dated back to the middle of the previous December, when he first felt off colour and complained of nausea and lassitude. About a week later his wife noticed that his eyes were yellow, and the patient observed that his urine was darker than normal. The general practitioner was called in, who confirmed the diagnosis of jaundice, and prescribed calomel to be taken at night and a Seidlitz powder in the morning. The patient continued with this treatment for three days, and the next night woke with very severe pain high up in the epigastrium. The pain was very acute for the first two hours, of a gripping character with waves of increased intensity, and it gradually faded away during the next thirty-six hours. The doctor now advised that the calomel and Seidlitz powders should be discontinued. Three weeks later, as the jaundice still persisted, a cholecystogram was taken at the local hospital. The gall-bladder was not filled with the dye, but no evidence of gall-stones was obtained. The patient had noticed that the stools were pale at the onset of the illness,

later they became putty-coloured and remained so until a week before I saw him.

At my examination he was well nourished, weighing 13 st. 4½ lb., but, between the middle of December and the middle of January, there had been a loss in weight of just over 1 st. The face and conjunctivæ were faintly tinged with yellow, and the skin of the trunk was slightly more icteric. The heart and lungs were normal. The liver was enlarged, firm, smooth and not tender. The lower border was 2½ in. below the right costal margin. The skin generally was dry. Screen examination of the chest showed no abnormality. The patient had not taken any alcohol since the beginning of the illness, and he had always been very moderate in this respect. I could find nothing abnormal on rectal examination, and no enlarged glands were palpable. The urine was orange-coloured, it contained no albumin and no sugar, but bilirubin was present. Mr. M. said that the yellow colouration of the skin was fading, and that the itching which had troubled him earlier was now disappearing.

I considered that the jaundice was due to an attack of catarrhal jaundice and that the acute pain had been caused by the passage of a small stone. It seemed probable that the failure of the gall-bladder to fill with dye in the cholecystographic examination was due to chronic cholecystitis, and that possibly the effort angina had been provoked by the same cause. In view of the persistence of the jaundice, however, I advised admission to hospital in London for further investigations.

The patient was in hospital for just over six weeks, during which time the weight remained constant at 13 st. (stripped). The jaundice was now very slight, the motions were dark and there was no longer evidence of extra-hepatic biliary obstruction. The urine was still dark, but only contained a trace of bilirubin. The temperature was normal during the stay in hospital, but the sedimentation rate of the red cells was raised to 25 mm./1 hour (Westergren), so that there was probably some active process still at work. The liver was now palpable 3½ in. below the right costal margin, and there was slight tenderness in the gall-bladder region.

Various liver function tests were carried out. The serum bilirubin content was raised to 3.2 mg./100 c.c. The direct van den Bergh test was positive. The plasma proteins were normal, total protein 6.8 G./100 c.c., albumin 4.5 G., globulin 2.3 G./100 c.c. The serum alkaline phosphatase was high, 65 King-Armstrong units/100 c.c. (normal 3-13 units). The thymol turbidity was normal, 1 unit. The raised alkaline phosphatase figure favoured the diagnosis of extra-hepatic biliary obstruction rather than that of hepatitis. Subsequent readings of the alkaline phosphatase were 65 units on February 23rd, 38 units on March 2nd, 43 units on March 6th, 39 units on March 13th, and

32 units on March 23rd. The blood count on admission was Hb. 90 per cent, white cells 5,700 per c.mm., polymorphs. 59 per cent, lymphocytes 30 per cent, monocytes 10 per cent, eosinophils 1 per cent. The sedimentation rate of the red cells steadily improved, falling to 10 mm./1 hour (Westergren) on March 10th. The cholecystogram showed very poor concentration of the dye in the gall-bladder, the shadow being insufficient to exclude the presence of gall-stones or of other abnormality.

Despite the fading of the jaundice and the apparent improvement in the patient's condition, I was still worried by the high alkaline phosphatase reading, and the rapid loss of weight prior to admission to hospital, and so arranged a consultation with another physician. The physician considered that the jaundice had been obstructive in origin and the most likely cause was a stone. He continued: "The onset of the illness and the fact that the stools recovered their normal colour after a few weeks favour a hepatitis, but against this view we must balance the lack of tenderness in the liver and the definite way which the non-clinical investigations point. The high alkaline phosphatase and the low normal thymol are both strongly suggestive of obstruction, but above all I feel that if there were sufficient liver damage going on to produce the present degree of jaundice the plasma albumin would not be maintained at its present level. If this is an obstruction I feel we can dismiss carcinoma of the head of the pancreas because of the incomplete block, but either stone or carcinoma of the ampulla might be responsible. The former seems more likely with the imperfect concentration of the dye in the gall-bladder, and the fact that this organ is not palpable. I think I should be inclined to put his present wasting down to his fat-free diet."

The most favourable features certainly appeared to be the clearing of the jaundice, the symptomatic improvement, the lack of nausea, the improved appetite, the diminution of lassitude, and the improvement of the sedimentation rate of the red cells. All these features were opposed to a diagnosis of malignant disease; but no one yet had suggested the correct diagnosis.

A few days later I wrote to the physician saying, "I think I shall call in a surgeon now. I have been hawering." And now I made a big mistake. The patient continued to improve, he said he did not wish to see a surgeon and I did not press the matter further. He returned home towards the end of the month, the jaundice having practically faded, although the liver still remained considerably enlarged, and I hoped that he was well on the way to recovery. The patient was instructed not to eat cooked fat, to have a low fat, high protein and high carbohydrate diet, and to take no alcohol for a year.

During the stay in hospital he was given methionine 1 G. in tablet form, t.i.d., and mg. 50 of vitamin B₁ were injected intramuscularly twice a week. One teaspoonful of magnesium sulphate dissolved in 2 oz. of hot water was drunk every morning on waking, after which the patient lay on his right side for half an hour before having breakfast.

A month after leaving hospital I received a letter from the patient saying the jaundice had disappeared and that he was going on satisfactorily and able to do more. This was followed by a period of silence of six or seven months. The general practitioner then rang me up saying he was strongly of the opinion that the patient had a carcinoma of the head of the pancreas as the jaundice had returned, the liver was enlarged and the patient looked thin and ill. And so a few days later in the middle of November, I was consulted again. Mr. M. told me that ten days previously, after a long motor journey, he noted that his stools were pale, and then his skin became a little yellow. The appetite remained good and there was no nausea, in contrast with the first attack of jaundice. He looked thin and ill, although the skin was only faintly tinged with yellow. The weight (clothed) was 12 st. 4 lb., a loss of 9 lb. since leaving hospital. The liver was enlarged 3 in. below the right costal margin, it had a sharp edge, was firm and not nodular. The spleen was not palpable. There was one very small gland above the left clavicle. The urine was orange in colour, containing bilirubin, but no sugar and no albumin. I felt nothing abnormal on rectal examination. The sedimentation rate of the red cells was 22 mm. per cent plasma at one hour. The alkaline phosphatase was still raised, 30 units/100 c.c. There was no further history suggesting biliary colic and I wrote to the doctor saying, "I think he has a recurrence of biliary obstruction and the liver is enlarged with fibro-fatty changes."

I advised the patient to go to bed at home and be treated on lines similar to those adopted during the first attack of jaundice. This was my second mistake. Two weeks later the doctor reported that the jaundice had increased a little but the patient seemed very well in himself, and cheerful. The jaundice was probably a little deeper than at any time during the first attack. The laboratory tests carried out at the local hospital now showed thymol turbidity 1 unit, alkaline phosphatase 33 units, serum bilirubin 6 mg./100 c.c. The plasma proteins were normal. To this I replied that I considered it possible that a laparotomy would be required if the jaundice did not clear up, in order to determine whether or not there was extrahepatic biliary obstruction.

After another week the doctor reported to me that the jaundice was more intense and the liver more enlarged, although the outline remained regular. The patient had gained 1 lb. in weight since being in bed, the motions were now considerably darker and the patient

emphasized the fact that whereas with the first attack of jaundice he felt very ill, he was now very fit and quite hungry.

On receipt of this letter I advised admission to hospital in London again as soon as possible. The doctor replied that the jaundice definitely varied and that the patient certainly did not look nor feel like a patient with a neoplasm.

On admission to hospital again at the end of the first week in December, the jaundice was much deeper than when I last saw the patient four weeks previously, and there had been a loss of another 4 lb. in weight. The motions were of a light yellow colour, and the urine was of a deep mahogany shade and contained bilirubin. The skin had been itching again for the last ten days. The liver was larger, the lower edge being 5 in. below the right costal margin; it was firm, but not tender. The serum bilirubin was higher, 9 mg./100 c.c., and the serum alkaline phosphatase had risen to 78 units/100 c.c. The thymol turbidity was 6 units, the colloidal gold test was negative, the cephalin-cholesterol was 1 unit, and the serum proteins were normal, albumin 4 G., globulin 2.9 G./100 c.c.

I at once called in a surgeon who advised a laparotomy. During the ten days before the operation the jaundice steadily deepened, the skin being of a dark yellow hue, with no green tinge. The motions rapidly became darker, and the Sister reported to me that they varied in colour daily, being darker each morning and lighter each evening. The variability of the jaundice during the entire history of the disease was opposed to a diagnosis of carcinoma of the head of the pancreas, but the appearance of the patient suggested he was suffering from some very serious condition. I could not make a diagnosis, and as it happened, I had never seen such a condition before.

At operation the common bile duct was found to be normal in size, and the gall-bladder was collapsed and empty. There was a carcinoma which appeared to have arisen in the region of the portal fissure. The right hepatic duct appeared to be completely blocked by growth, but the left hepatic duct, although invaded, was not completely obstructed. The common bile duct was opened, and it was found possible to pass a probe through the growth into the dilated right hepatic duct which contained "white" bile. A probe was passed down the common bile duct into the duodenum without revealing any obstruction. A polythene tube was inserted through the growth into the right hepatic duct and led down the common bile duct and left in position (see Fig. 19). A gland was removed from alongside the common hepatic duct, section of which showed reactive hyperplasia with bile pigment in the reticulo-endothelial cells, but no evidence of carcinomatous invasion.

The jaundice very slowly diminished after the operation, the skin

of the patient being a very pale yellow colour six weeks later; at this time the colour of the urine had changed from a deep mahogany to a rather dark amber hue. The motions were dark and the bowels worked regularly twice daily without an aperient. The patient, during these

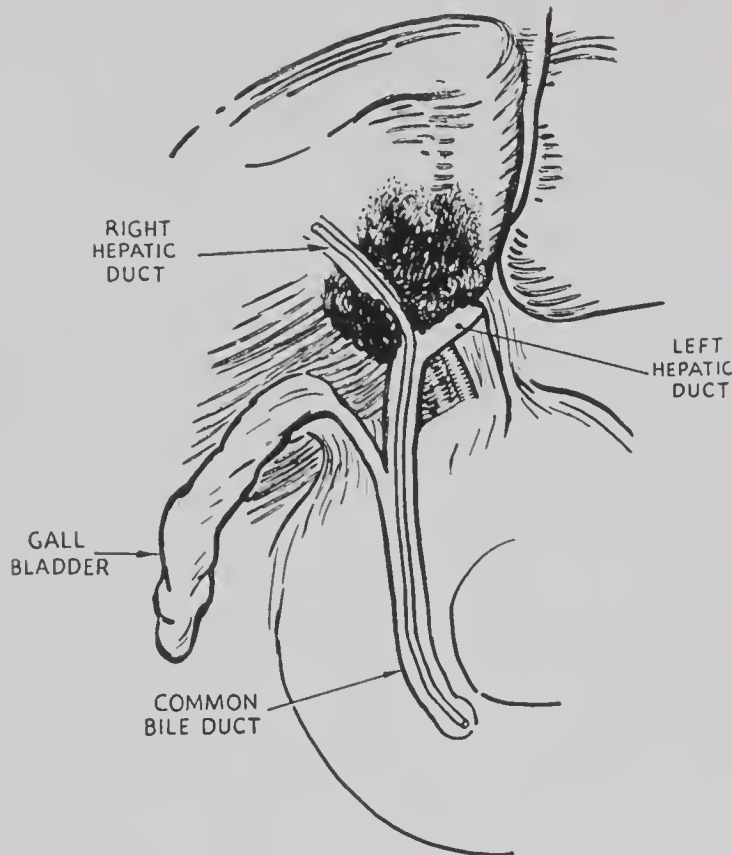


FIG. 19. Diagram of operation findings in carcinoma of right hepatic duct.

six weeks, became weaker and thinner, but suffered no pain. He did not appear to appreciate the seriousness of his condition, because towards the end of January, when troubled with great urgency of bowel action, which sometimes was uncontrollable, he said, "I shall have to get this better before I return to the city." During January the temperature rose and there were several rigors, in which the temperature reached 105° F. These were presumably due to absorption of toxin from the necrotizing growth.

Comment. If we assume that the whole illness was due to a carcinoma arising in the right hepatic duct, which is the most likely explanation, the attack of biliary colic was probably due to a detachment of a small portion of the growth and its passage down the common bile duct. It must then have caused a complete obstruction of the duct which resulted in the putty-coloured motions. When it passed into the duodenum the obstruction was relieved and the jaundice cleared. The growth must then have slowly increased in size causing obstruction mainly of the right hepatic duct, sufficient bile passing into the intestines,

probably from the left hepatic duct, to prevent the stools from becoming clay-coloured.

The disappearance of the jaundice for six months or so was possibly due to the detachment of the portion of growth having temporarily opened the passage, and so relieving the obstruction. The improvement of the sedimentation rate, as the jaundice disappeared in the first attack, is interesting, as it occurred despite the fact that the carcinoma must still have been growing. The persistently raised serum alkaline phosphatase figure truly indicated the presence of an extra-hepatic obstructive biliary lesion, and, in view of this, laparotomy should have been performed at an earlier date, although the disease would not then have been curable by operation.

I do not know, reader, whether you will consider the explanation I have propounded to be satisfactory, or whether you are, like Sydenham, "a man of many doubts."

THE ACHING SIDE

"Second thoughts are best."

SPANISH FRYAR

THE physician who examines a patient in his consulting rooms, or who is called out to see a patient with the general practitioner, suffers from a certain disadvantage in having to observe all the available evidence at one examination and to form an opinion at the time of the consultation. He has not the opportunity of thinking the case over, and, if necessary, of examining the patient again to search for points of clinical significance which might support, or possibly exclude, the diagnosis originally formed.

Even the greatest physicians have realized their weakness in this respect, for it is recorded of Thomas Addison that "He has also been known, after seeing a patient within the radius of eight or ten miles, to remember on his near approach to London, thinking over the case on his way, that he had omitted some seemingly important inquiry, and to have posted back some miles for the purpose of satisfying his mind on the doubt which had occurred in it."

In September 1952 I was asked to see a surveyor, thirty-nine years of age. Fourteen years previously the left epididymis had been removed on account of a tuberculous infection, and at the same time a pleural effusion formed on the left side, for which he was treated in a sanatorium for four months. Subsequently he returned to work and was kept under observation at a chest clinic.

In January 1952 he first complained of an ache or a pain in the left chest. X-ray examination showed evidence of pleural thickening on the left side, and the physician at the clinic considered that the symptoms were probably due to "a patch of pneumonitis." A course of penicillin and sulphonamide was given, but as the pain persisted the physician now thought that it was due to pleural adhesions and referred the patient to the physiotherapy department for treatment. He was given short-wave therapy and ultraviolet light, with still no relief from the ache and so, in September, I was asked to see him.

The patient did not look ill, but he had lost 1 st. in weight during the previous eight months and he still complained of a persistent ache in the back at the level of the eleventh thoracic vertebra extending round the lower part of the left chest. There was also pain referred to the right lower chest of more recent origin, and he said that he was afraid to move his back owing to the pain.

The percussion note was impaired over the lower two-thirds of

the left lung, with weak breath sounds, coarse râles and a few pleural crepitations. Screen examination of the chest showed diminished movement of the left diaphragm, with left costo-phrenic adhesions. The film revealed numerous calcifying spots throughout the lower half of the left lung, with obliteration of the left costo-phrenic angle. The mouth temperature was 98.4° F. at 4.30 p.m., but the sedimentation rate of the red cells was raised to 27 mm. per cent plasma at one hour.

I thought the pain was due to an active tuberculous pleurisy and advised the general practitioner that the patient should go to bed and be given a course of iso-nicotinic acid hydrazide (I.N.A.H.), and that he must have no physiotherapy.

Meditating on the case a day or so later I was impressed by the segmental distribution of the pain, by the fact that the pain was now also spreading round the right side of the chest, and by the patient's statement that he was afraid to move his back owing to the pain. I had not paid due attention to the significance of these points at the time of my examination, neither had I carefully tested the spinal movements. The fact that the left epididymis had been involved indicated that the tuberculous infection was disseminated at that time, and this suggested that localization might have again occurred at a fresh site.

I could not repair my error of omission by examining the patient again, but I wrote a second letter to the doctor asking him to arrange for an X-ray examination of the spine. A month later I received his answer; there was a tuberculous lesion affecting the lower part of the thoracic spine, and arrangements were being made for the patient's admission to hospital for treatment.

RECURRENT ATTACKS OF VOMITING

PATIENTS, especially women, who consult their doctors on account of recurrent attacks of vomiting run the risk of being labelled as "functional" or "neurotic," especially if the attacks follow some emotional upset, if no abnormal signs can be found, and if the investigations which have been carried out yield no helpful results.

In October 1950 I was consulted by a lady, fifty-six years of age, a native of India, who was afflicted by this complaint. The first attack took place early in March 1950. It began with what she described as an "ordinary tummy-ache" near the navel, which she had had several times before. This was quickly followed by pain in the back of the chest, between the vertebral border of the left scapula and the spine. The patient then vomited green-brown fluid, with rapid relief of the pain. The vomit on this and subsequent occasions did not contain any food residue. During March and April the attacks were relatively few and lasted only about half an hour, but in May they became more frequent and persisted for an hour or longer. They now occurred both by day and by night, and were always accompanied by vomiting, but the later attacks differed from the early ones, as the vomiting did not always relieve the pain. The temperature was never raised during an attack.

In June and July the patient told me that the pain was almost unbearable, and on some occasions it would last all day. It was then chiefly situated around the navel and in the left flank. The pain was usually of a twisting or griping nature, but there was no action of the bowels during an attack. Since the onset of the symptoms the bowels had been constipated and were only opened with the aid of aperients.

Mrs. M.'s doctor in India wrote to me, saying, "Since the middle of May the attacks have become more formidable as regards frequency and severity. The pain occurs two to three times daily, followed almost every time by two or three projectile vomits. These attacks last almost two to three hours, but mild pain persists in the intervals. There was a severe attack on August 18th. The only physical signs present then were (1) marked tenderness in the epigastrium, (2) definite tenderness in the left lobe of the liver, and (3) tenderness of the left erector spinæ muscle opposite the spinous processes of the seventh to ninth thoracic vertebræ. Since the middle of May her appetite has diminished and she has lost about 15 lb. in weight. Skiagrams of the chest, kidneys and gastro-intestinal tract show nothing abnormal. There is no diaphragmatic hernia. The spine shows osteoarthritis in the dorsal region. The stool report shows no abnormality. The urine contains a

trace of albumin. The serum amylase is normal. The blood sugar curve persists at the threshold level for about an hour. Mrs. M. has been treated with a course of emetine injections and with Entero-Vioform tablets by mouth. She has had Bellafoline, Cibalgin and Bellergal, also Panteric tablets. The attacks became less frequent and milder, the last attack occurred on September 16th, 1950. She had been treated as a case of chronic pancreatitis with left lobe hepatitis."

I also received a letter from a surgeon who had seen the patient in India. He wrote, "The question of a pancreatic lesion (neoplastic) arises in my mind. I have suggested an exploratory laparotomy to settle the diagnosis."

I examined the patient on October 5th, three days after her arrival in England by plane. There had been a slight attack of abdominal pain and vomiting the day before I saw her. Mrs. M. told me that in 1913 she had an acute attack of appendicitis, but the appendix was not removed. In 1935 she had an operation for prolapse of the uterus, and in 1946 one for umbilical hernia. A few days before the first attack of vomiting she fell on a platform when alighting from a slowly moving train, and bruised the right side of her body and right elbow.

The abdomen was lax and easy to examine, but I could feel nothing abnormal. There was slight tenderness on deep pressure in the sub-costal region on each side and over the descending colon. The patient was still conscious of a little pain below the inferior angle of the left scapula. Despite the loss of weight she was well nourished, weighing 9 st. 7 lb. (clothed), and being 5 ft. in height. She said that she had been very fat previous to the present illness. I saw the films of the barium meal taken in India which appeared to show an abnormal coil or kink in the region of the splenic flexure, and I made a provisional diagnosis of recurrent attacks of colonic spasm.

The patient was shortly afterwards admitted to hospital under my care for further investigations. During a stay of three weeks Mrs. M. had three or four attacks of pain and vomiting. The pain usually began in the back to the left of the mid-dorsal region and radiated round the left side towards the xiphoid cartilage. Between the attacks there was no tenderness over the dorsal spine, the movements of the spine were full and did not provoke pain.

The investigations which were carried out were not very helpful:
Barium meal: The barium passed normally down the œsophagus. Nothing abnormal was seen in the stomach, which was empty in four hours. The duodenal cap filled and emptied normally and there was no X-ray evidence of abnormality in the coils of the small intestine.
Barium enema: Normal. *X-ray of spine:* Some osteoarthritic lipping of the dorsal spine. *Intravenous pyelogram:* Normal. *Cholecystogram:* Normal. *Van Slyke urea clearance test:* Renal function 51 per cent of

normal. *Blood urea*: 20 mg./100 c.c. *Urine*: No protein, no casts. *Fractional test meal*: Slight increase in free and total acids from $\frac{3}{4}$ to $1\frac{3}{4}$ hours. No blood in the specimens. *Blood count*: Hb. 87 per cent. Normochromia. White cells 6,300 per c.mm., polymorphs. 52 per cent, lymphocytes 40 per cent, monocytes 3 per cent, eosinophils 5 per cent. *Blood Wassermann reaction*: Negative.

The only diagnosis which I could make, although very inadequate, was that the pain was due to osteoarthritis of the spine, a root pain, and the vomiting to colic, either secondary to spasm of the pylorus or of the splenic flexure. Why the vomiting should relieve the pain was not explained, unless the pain was due in part to hyperchlorhydria. This would not, however, explain the relief of the pain in the left side of the back. The patient was treated with a convalescent stage peptic ulcer diet, and with radiant heat to the back. I also ordered a light abdominal support, in case there was an element of visceroptosis causing dragging or kinking in the region of the splenic flexure.

I was disappointed that no further light had been thrown on the nature of the illness either by observing the attacks in hospital or by the investigations. Perhaps one useful purpose had been served; my newly qualified and highly scientific house physician, a bachelor of science, realized now how very difficult clinical medicine can be.

I saw Mrs. M. again early in December 1950. Despite the radiant heat treatment and the abdominal support, she had suffered five more attacks of pain and vomiting, although none of them very severe, during the three and a half weeks since leaving the hospital. The patient now returned to India and in January 1951 had the most severe attack of pain and vomiting that she had ever experienced.

I heard nothing more for two and a half years, when Mrs. M. came again to see me to report progress. I was delighted to find that she was now cured. She looked very well and had regained her lost weight. In March 1951 she passed blood in the motions, and a laparotomy was carried out. An ulcer was found on the posterior wall of the stomach, adherent to the pancreas. Since the operation the pain in the back and in the abdomen had completely disappeared and there were no further attacks of vomiting.

Comment. Why did we fail to diagnose the nature of the illness while the patient was in hospital? Perhaps it would have been possible to see the ulcer by gastroscopy, although the barium meal failed to reveal its presence. The diagnosis made by the surgeon in India that the pancreas was affected was correct, although fortunately it was not a pancreatic carcinoma.

In carcinoma of the pancreas the pain may be very severe and continuous. In 1931 I saw a man, forty-nine years of age, on account of agonizing pain across the back in the lower dorsal region. He had

been ill for three months and no cause had been found of his sufferings. His doctor told me that he looked very ill, with a bad colour and toxic appearance, but his temperature was normal. When I saw the patient the next day, there was slight jaundice for the first time, and the urine contained bilirubin. I made a diagnosis of carcinoma of the pancreas and liver, with involvement of the spinal nerve roots or of the vertebræ, probably the latter, as the pain did not radiate round the waist. I have never forgotten this consultation although it took place twenty-three years ago. I found the patient squatting on his heels with his back to an electric fire. Apart from injections of morphine this was the only way in which he obtained some relief from his pain, and he spent the greater part of the day in this position. He could neither lie in bed nor sit in a chair owing to intensification of the pain. He rapidly became worse and died two weeks after my first visit. The post-mortem examination showed an extensive carcinoma involving the whole of the pancreas, spreading to the stomach and invading its outer coats. There was no gastric ulceration. The growth was firmly bound down to the vertebræ, but had not eroded them. A secondary deposit in a gland was compressing the common bile duct.

A second case of recurrent attacks of vomiting was not so difficult to diagnose. The patient was a married woman, twenty-eight years of age. The first occasion was three and a half years before my visit, and shortly after the death of her father. The patient was referred to a neurologist, who found no organic cause for the vomiting. The doctor who called me in had seen the patient in four subsequent attacks, the last three being in the space of six months. On each occasion the vomiting appeared to be preceded by a small emotional disturbance, the patient being described as "highly strung and of an artistic temperament." The first symptom was always nausea and this was followed by repeated vomiting, the patient not being able to retain even water. The attacks might last for a few hours or for several days. The last two upsets immediately succeeded the termination of a menstrual period, and none were pre-menstrual.

Five years previously, after a sudden abdominal pain, a barium meal examination was carried out, and a diagnosis was made of "grumbling appendicitis."

When I saw Mrs. T. she was just recovering from an attack which had lasted for six days. There was no history of train, car or air sickness, but on enquiry I learned that she often vomited as a child and did not want her breakfast.

I was asked to take the patient into hospital to determine the cause of the vomiting attacks and to prevent their reoccurrence. The barium meal report was as follows: The barium passed normally down the œsophagus. A gastric diverticulum was present high up on the

posterior wall (see Fig. 20). Apart from this there was no X-ray evidence of abnormality in the stomach, which was empty in four hours. The duodenal cap was not tender. It filled and emptied normally and there was no evidence of duodenal ulceration, or other abnormality in the coils of the small intestine. At twenty-four hours some of the barium had been evacuated, and the barium meal examination showed no X-ray evidence of abnormality in the colon. The cholecystogram



FIG. 20. Diverticulum high up on posterior wall of stomach.

was normal. The blood count was Red cells 3.9 millions per c.mm. Hb. 85 per cent. C.I. 1.06. Mean corpuscular hæmoglobin concentration 34 per cent. White cells 6,100 per c.mm., polymorphs. 59 per cent, lymphocytes 37 per cent, monocytes 1 per cent, basophils 1 per cent. The anæmia therefore did not show an iron deficiency, as the M.C.H.C. was not below 32 per cent, the lower limit of normal.

It seemed probable that the periodic attacks of vomiting were due

to retention of food in the gastric diverticulum and I advised a consultation with a surgeon if the attacks persisted and were not prevented by the administration of a kaolin and bismuth mixture. The patient did see a surgeon several months after leaving hospital, as the attacks recurred and he advised an operation. She was not, however, willing at the time for it to be performed.

Comment. A gastric diverticulum is usually a congenital abnormality. It is generally situated near the cardia on the lesser curvature or posterior wall of the stomach. An acquired gastric diverticulum is very rare, but may form in connection with a gastric ulcer. A gastric diverticulum is said rarely to cause distress, but the barium meal examination may show the barium remaining in the diverticulum when the stomach is empty, and food will presumably do the same in these cases. Stagnation may then give rise to vomiting and gastric irritability, in which case the diverticulum can be removed or obliterated by invagination.

MY INGLORIOUS HOUR

“Boast not thyself of to-morrow; for thou knowest not what a day may bring forth.”

THE PROVERBS

ON Friday, March 7th, 1941—can I ever forget the day—I was asked to see a young aircraftman, twenty-three years of age, on account of rheumatic symptoms.

In the winter of 1939, which was particularly severe, while living under conditions sufficient to test the resistance of the most spartan, this young man developed an attack of rheumatic fever. It was not very acute, and, after being in bed a month, he was sent on twenty-one days' leave. During the next winter, which was also bitterly cold, the aircraftman was encamped in the north of England, and, after sleeping in a damp bed when on leave, was admitted to a civilian hospital in London with acute pain in the right knee. A week later he was again sent on leave, but not feeling well consulted a civilian doctor who referred him to me. The doctor certified that he was still unfit for duty, and, with a temperature of 99° F. and a rapid pulse, he clearly required further treatment.

When I examined the patient I could not find any signs of rheumatism, he was suffering no pain, but the temperature at midday was raised to 103° F. Thinking that he possibly had an attack of influenza I arranged for immediate admission to hospital.

In the afternoon I made my ward round. I did not examine the patient again but I noticed him lying in bed with face flushed and conjunctivæ injected. Glancing at the chart I saw the temperature was now 104·8° F., and thought, “Well, its a good thing I admitted him!”

Next morning my house physician rang me up and said that arrangements were being made to transfer the aircraftman to a fever hospital, as a typical measles rash had appeared on his forehead near the roots of his hair and behind the ears. He also added that on examining the patient after my ward round he noted Koplik's spots.

I was covered with confusion, and wondered how I should be received at my visit next Tuesday. What had the resident medical officer said on being landed with a case of measles through the recommendation of an honorary physician to the hospital? I went hot and cold as I thought of it. The ward, meanwhile, was put in quarantine, but unfortunately, eleven days later, one of my clerks succumbed to the same complaint.

I had examined the patient's mouth, I had noted the throat was very red, but I had not looked for Koplik's spots.

WHOSE WAS THE MISTAKE ?

“ We are none of us infallible, not even the youngest.”

REMINISCENCES

DESPITE many years of practice I seldom attend a consultation in a patient's house without a certain feeling of apprehension. The further I travel to the consultation the greater is my appreciation of the irrevocability of the opinion I shall be called upon to express. In the majority of cases there is no cause for such anxiety, the diagnosis being easy and the treatment conventional. From time to time, however, the consultant is confronted with a problem which taxes his skill and experience to the uttermost, and which, although on the face of it commonplace, on closer inspection becomes more difficult and doubtful the more carefully all the facets of the illness are considered. A good working rule is never to accept a ready-made diagnosis.

One afternoon in the spring of 1952 I was asked to see a patient said to be suffering from pleurisy. The illness began about four weeks previously with fever and pain in the left side of the chest. After a few days' rest in bed the temperature fell to normal and the patient was allowed to get up. Within a day or so, however, the temperature rose again, and, for the two weeks preceding my visit, it had ranged from 99° to 100° F. each evening. Chloramphenicol capsules had been given without any favourable result. The patient complained of sweating, but there was no cough and no expectoration. For one day only had pain been felt at the tip of the left shoulder, suggesting some diaphragmatic involvement. An X-ray film of the chest showed diminished translucency at the left base, sufficient to obscure the diaphragm, but the area of lung fields which could be seen, appeared normal, and there was no cardiac displacement. The white cells of the blood numbered 8,000 per c.mm., with a normal differential count.

I found the patient well nourished, but a little pale; she appeared ill, as if suffering from a prolonged fever. There was no cyanosis and no apparent embarrassment of breathing. The percussion note was dull at the base of the chest on the left side behind, tactile fremitus was diminished, the breath sounds were weak and a coarse friction rub was audible. Over a small area near the angle of the left scapula ægophony could be heard, suggesting dry pleurisy below with a small effusion above. I could find nothing abnormal in the abdomen, or elsewhere. It seemed likely that the pleurisy was either tuberculous or rheumatic in origin, and I advised painting the base of the chest with tincture of iodine and the administration of a salicylate mixture.

A week later the general practitioner telephoned me, saying that the temperature was now rising to 101° F. in the evenings, and that the signs of effusion were more clearly marked at the left base. The hæmoglobin was 65 per cent. I advised that a specimen of fluid should be removed and examined microscopically and by inoculation into a guinea-pig.

The patient was now moved to a nursing home and the chest explored by the practitioner. The report on the fluid was as follows: "The pleural effusion is turbid, of a yellow colour and it contains a shaggy coagulum. No tubercle bacilli were found. No bacteria were present in the Gram-stained smear. Stained preparations of the centrifugalized deposit and of the coagulum showed large numbers of leucocytes and pleural endothelial cells, and small numbers of red blood cells and histiocytes. About 60 per cent of the leucocytes were neutrophils and 40 per cent lymphocytes. There were also present groups of cells showing irregular nuclear patterns, some being bi-nucleate. Their cytoplasm was fairly well defined. These cells, although most probably of pleural origin, could not with certainty be described as benign. A guinea-pig has been inoculated and a culture put up for the tubercle bacillus."

In view of the possibility that the pleural effusion was tuberculous in origin, and as the temperature was higher, reaching 101°–102° F. in the evening, the patient was now given a course of streptomycin injections. When I received the report on the fluid a few days later, I rang up the doctor saying that the condition might be a pleural endothelioma, but I advised that the streptomycin injections should be continued. They appeared to have a beneficial effect, for the temperature fell to normal two weeks later, and on May 29th the practitioner telephoned me again to report that the patient was very much better and the pleural effusion had absorbed. The hæmoglobin, however, had fallen to 60 per cent, despite the administration of an iron preparation by mouth. In view of this I suggested that a further X-ray should be taken of the chest and that the fæces should be examined for occult blood.

I heard nothing more for a further two weeks when I was asked to see the patient again in consultation with the general practitioner. On arrival at the nursing home I found the temperature charts arranged on the table in the waiting room, together with the X-ray films. The temperature had now been normal for several weeks, but the second X-ray film showed little change from the first. There was still a dense shadow at the left base, obscuring the diaphragm, and suggesting something more solid than thickened pleura. The guinea-pig inoculation test and the culture of the fluid showed no evidence of tuberculosis. The occult blood test on the fæces was strongly positive on two occa-

sions, and the doctor, on making a rectal examination had felt what he considered to be nodules in the wall of the rectum, and, very wisely, had called in a surgeon.

The surgeon after examining the rectum said there was no tumour there, and suggested the possibility that the nodules, which were situated outside the rectum, might be due to endometriosis. Further, he had sigmoidoscoped the patient and found no evidence of disease, and abdominal examination had revealed nothing abnormal. The hæmoglobin, despite intensive iron treatment, was still only 65 per cent, and it was to explain this that I was invited to a second consultation.

I had now the opportunity of examining the patient again from head to foot. She was looking and feeling better than at my previous visit, the fever had abated, and she appeared more cheerful. She was well nourished, though pale, and there was neither cough nor shortness of breath, and no pain. I enquired about the appetite which was satisfactory, there were no symptoms of indigestion, the bowels were opened regularly and the motions appeared normal. No blood nor mucus had been noticed in the fæces, and there was no vaginal hæmorrhage. The patient was now getting up for a few hours each day and sitting in the garden when the weather permitted. I could detect no signs of pleural effusion, although the percussion note was still impaired at the left base behind, where the breath sounds were weak and the voice conduction diminished. The physical signs were compatible with thickening of the pleura. I examined the abdomen very carefully and could feel nothing abnormal under the left costal margin, or elsewhere. External piles were present, which the patient said bled from time to time, and it seemed possible that they were the source of the occult blood in the fæces. The fact that the pleural fluid had apparently absorbed, or certainly had not increased in amount, was opposed to a diagnosis of pleural endothelioma or of malignant disease of the lung.

As I made my examination I thought over the history of the illness and concluded that the source of the occult blood must afford the solution to the problem. I explained my views to the patient's husband, and when asked why the surgeon did not appear to attach any importance to it, I replied, "Surgeons consider big things, physicians are concerned with small matters." I then advised that a barium enema should first be given to exclude the possibility of a lesion in the splenic flexure which might have irritated the diaphragm and so caused the pleural effusion. Should this show nothing abnormal a barium meal would probably indicate whether a peptic ulcer was present in the stomach or duodenum, whose only manifestation was the minute amount of blood in the motions.

The patient was taken by car a few days later to the radiologist for the barium enema, and the practitioner telephoned me to say that

it revealed the presence of a carcinoma of the splenic flexure, which was threatening to cause obstruction. It appeared to me probable that the growth was inoperable and adherent to the diaphragm, but I advised that the help of a surgeon should once more be sought.

I heard nothing further until about a month later I telephoned the doctor asking for the latest news. He apologized for not letting me know before and said that a laparotomy had been performed two weeks previously, after a preliminary blood transfusion. A growth was found in the splenic flexure adherent to the diaphragm, the peritoneum being studded with secondary deposits, the nodules felt previously on rectal examination being also secondary growths. In view of the threatened obstruction the transverse colon was anastomosed to the descending colon and the abdomen closed. The patient now appeared to be remarkably well and was quite unaware of the serious nature of her illness.

The general practitioner remarked that it was very strange that the onset of the illness was with pleurisy and that throughout its course there were no signs pointing to the primary lesion in the intestine. As he spoke I wondered whether he was still ignoring the significance of the positive occult blood test, for "he that contemneth small things shall fall little by little."

PLEURAL EFFUSION

*“ There was a Door to which I found no Key:
There was a Veil past which I could not see.”*

THE RUBÁIYÁT

TOWARDS the end of 1938 I was consulted by a native of Burma, a judge, on account of a trivial complaint, a small swelling on the back of the chest. The patient had always enjoyed good health, but during the previous year suffered from an itching eruption on the head, which he attributed to wearing his judicial wig. The rash spread to the neck and back, and, not being relieved by ointments, eventually disappeared after the application of certain herbal remedies.

Early in 1938 the judge's wife noticed a small lump on the back of her husband's chest on the right side. Herb powders were applied, but the lump remained, unaltered in size. It caused no pain, but from time to time, there was a sensation as if the nerves in the shoulder and side of the chest were strained. The swelling presented the characteristic features of a lipoma. It was just over an inch in diameter, not tender, and there was no redness of the overlying skin. As I made my examination I remembered a clinical lecture given at the Middlesex Hospital by Sir John Bland-Sutton, when I was a student. The subject was lipomata, the patient a man with a moderately large fatty mass situated in the upper and inner part of the right thigh, and the advice given was that such tumours should be left alone unless they rapidly increased in size, when they should be removed for fear of the onset of malignant changes.

The occasion was probably imprinted on my memory because, at its conclusion, each member of the audience was presented with a copy of the lecturer's book, "Tumours Innocent and Malignant." I did not hesitate, therefore, to advise the patient to return to his native country, and to have nothing done to the tumour unless it showed signs of growth.

Eleven years later a patient was admitted under my care to the Brompton Hospital in somewhat unusual circumstances. He had been on a visit to England, and, in the middle of October 1949, embarked at Liverpool to return to Burma. He gave my house physician the following medical history: "After I had been at sea for three days I was on deck when suddenly I had an attack of shivering which passed off after a few minutes, when I felt quite normal again. The next day, however, I felt out of sorts on getting up. After breakfast I went back to my cabin and lay down as I noticed my forehead was very warm,

although not sweating. Finding I had lost my appetite I did not have anything more to eat that day.

“ The following day I still had no appetite, and being feverish and weak, was seen by the ship’s doctor, who said I had influenza and prescribed aspirin. As my symptoms persisted, two days later the doctor gave me quinine, thinking I had malaria. This did not help me, and after a further two days, during which I was becoming more feverish and weak, I was ordered M. and B. tablets, which again had no effect.

“ On reaching Port Said I was moved to a hospital on shore, being now very weak and ill. I was in hospital a month, my weakness becoming progressively worse, despite various injections, and when eventually fluid was taken from my chest, I felt that I was about to die. I was then flown back to London and admitted at once to the Brompton Hospital.”

I also received a report from the doctor who looked after the patient while he was in hospital at Port Said. He said that the patient’s temperature had been continuously raised, between 99.8° and 100° F. throughout the illness. The chief symptoms were lassitude, a poor appetite, chills, sweating, and constipation for four days before admission to hospital. There had been no diarrhœa and no vomiting. A diagnosis of right basal pneumonia had been made on board ship, but no abnormal signs were found now in the lungs and an X-ray examination of the chest was normal. A blood film showed no malarial parasites, the Widal reaction was negative, no ova, amœbæ or cysts were found in the fæces, the blood and urine were sterile, and the sputum contained no tubercle bacilli. The white cell count of the blood was 14,000 per c.mm. Two weeks later signs of effusion were noted at the right base, and 20 c.c. of clear, straw-coloured fluid were removed, which was sterile on culture. On November 21st, three days after exploration of the chest, the patient suddenly collapsed, became cold and cyanosed, and the pulse rate rose to 140 a minute. The amount of fluid was now found to have increased considerably, but after aspiration of 27 oz. there was considerable improvement. The doctor added that he had not been able to determine the cause of the effusion. Such were the bare details of the case with which I was presented.

The patient was very ill on admission to the Brompton Hospital on December 3rd. He was a small man, just over 5 ft. tall, with the pale yellow complexion common to his race. He had lost about $1\frac{1}{2}$ st. in weight and was now almost “ spectre-thin.” The skin was dry, the tongue coated with a thick white fur, and there were signs of a right-sided pleural effusion extending half-way up the chest. Neither liver nor spleen were palpable. The temperature was 99.8° F. in the

morning and 102° F. in the evening. The following special examinations were carried out:—

X-ray of chest: Right lung, collapse and consolidation of the lower lobe, with some overlying fluid. Left lung, scattered mottling opposite the second interspace.

Blood culture: Sterile. *Blood count:* Hb. 78 per cent. White cells 10,000 per c.mm., polymorphs. 74 per cent, lymphocytes 24 per cent, monocytes 1 per cent, basophils 1 per cent. *Sedimentation rate:* 100 mm./1 hour (Westergren). No malarial parasites seen. *Kahn and Wassermann reactions:* Negative.

Agglutination tests: Negative for typhoid, paratyphoid, abortus and melitensis groups of organisms.

Urine: A trace of albumin, occasional hyaline casts. No bile salts or bilirubin. A few coliform organisms on culture.

Fæces: No pathogenic organisms, ova or cysts.

On the day of admission 60 c.c. of straw-coloured fluid were aspirated from the right pleural cavity. The fluid contained a large number of white cells, predominatingly neutrophils. It was sterile on culture. The fluid was cultured for tubercle bacilli and a specimen was inoculated into a guinea-pig. Both these examinations subsequently proved negative. The condition appeared to be one of acute pleurisy with effusion, of an inflammatory type. Two weeks later it was noted that the liver was palpable, 1½ in. below the right costal margin. The temperature was still of an intermittent type, usually 100°–101° F. in the evening, and the sedimentation rate of the red cells had risen to 135 mm./1 hour. A further 20 c.c. of fluid were aspirated from the pleura, the effusion still being clear and sterile. During this time daily intramuscular injections of 1 G. streptomycin had been given, without any beneficial effect, on the supposition that the effusion might be tuberculous. A new sign now appeared—pitting œdema over the lower part of the back of the trunk, extending to the level of the eighth thoracic spine, the œdema being more marked over the right than over the left side of the chest. The patient was becoming progressively weaker, sweating profusely at night, and there was further loss of weight.

Having failed to make the correct diagnosis, which is probably now obvious to the reader, I decided to call in the help of a surgeon, on the supposition that there was some inflammatory lesion below the diaphragm on the right side. The œdema of the chest wall, the excess of neutrophils in the pleural fluid, and the apparent increase in size of the liver supported this view. It was about this time that I discovered that the patient had consulted me previously for the small lipoma on the back, and I was interested to find that it had not increased in size, if anything it appeared a little smaller.



Fig. 22. Burmese Ivory.



FIG. 23. Burmese Ivory.

tion a stenosis was felt within the reach of the finger, which would just admit the tip of the finger. When I read this report I realized that if I had examined the rectum when the patient was first admitted to hospital I should have found the clue which pointed to the diagnosis. The sigmoidoscope was passed through the stricture, and it was seen that the mucous membrane of the upper rectum and lower sigmoid was abnormal, being thickened and almost papillomatous, but not ulcerated. The mucous membrane higher up was more normal, but was still rugose on the right lateral wall. There was little doubt that the condition was one of amœbic proctitis and colitis, but no amœbæ were found in the swabs taken.

Treatment was completed by a second course of emetine bismuth iodide, gr. 3, daily by mouth for ten days, and a Yatren retention enema was given for six nights, consisting of 6–8 oz. of a 2·5 per cent solution. The patient had now gained about 1½ st. in weight since admission to hospital. Screen examination of the chest showed no evidence of a pleural effusion, and nothing abnormal was seen in the lung fields. The liver was no longer palpable. A few weeks later the judge returned to Burma and in the following July I received a letter in which he wrote that he was continuing to make good progress and recover his strength.

Despite the fact that the credit of making the correct diagnosis belonged to the surgeon, it was I who received the praise. The patient wrote, "It is you who saved my life, and I am sending some curios from Burma by one of my friends who will be proceeding to England in a short while." The beautiful ivories which are illustrated in the text (see Figs. 22 and 23), arrived safely packed in cotton wool and screwed into wooden boxes.

"Carved with figures strange and sweet
All made out of the carver's brain."

THE CATHERINE WHEEL HEADACHE

ONE year, about August 20th, a man, fifty-seven years of age, first noticed a headache. Previously he had always been very well and could remember no illness which kept him in bed. The headache gradually became worse and ten days later he consulted his doctor.

The pain appeared to originate in the left temporal region, just above the ear. It was described as sharp and at the same time throbbing, and it was at its worst in the early hours of the morning. At times it circulated across the forehead and round the face and chin in an anti-clockwise direction "like a catherine wheel." Owing to the pain the patient could not concentrate on his work, which was that of a builder's manager, and the general practitioner advised a change of air at the seaside, in the hope that this would cure the headache. The day after arriving on the coast the headache was so severe that the patient felt he must stay in bed: he telephoned his doctor in London who advised him to return home, which he did the next day, and, on September 7th, his doctor brought him to see me.

On questioning the patient I found that he had not vomited, but food had regurgitated two days previously. He had suffered no "falling attacks." There was tenderness over the left side of the skull in the temporo-parietal region, but I could hear no murmur there. The pulse rate was 70 beats a minute, the rhythm was regular, and the only abnormal sign that I could find on examination of the central nervous system was papilloedema in both eyes with engorged retinal veins. This was serious enough and indicated the probability of a cerebral tumour.

Six days later Mr. Y. was admitted to hospital where he was examined by a neurologist. There were now further abnormal neurological signs; these included slight weakness of the palate on the right side and of the right facial muscles, diminution of the right corneal reflex, impairment of postural sense in the right hand, and a tendency to an extensor plantar response and to ankle clonus on the right side. The patient was drowsy and vision was impaired. X-ray examination of the skull showed evidence of rarefaction of bone in the left temporo-parietal region. The conclusion was that the lesion was a meningioma.

A lumbar puncture showed the cerebro-spinal fluid to be under considerable pressure, over 300 mm. C.S.F. The fluid was clear and colourless. The protein content was normal, 0.02 per cent. There was no excess of globulin, the cell count was two lymphocytes per c.mm., and the Wassermann reaction was normal. The normal protein content of the fluid was rather against a diagnosis of meningioma.

Three days later the skull was opened by a subtemporal trephine

with extension on the left side, and an encysted blood clot, situated subdurally, was removed. The dura over it was thickened and the brain compressed by the clot. The patient was therefore suffering from a chronic subdural hæmatoma. Being a builder, he had frequently struck his forehead against timber beams, but never violently, and there was no special occasion which he could remember. He made a good recovery, the headache and drowsiness rapidly disappeared, although there was still some papillœdema on leaving hospital.

Comment. The hæmorrhage in the subdural space is probably due to rupture of veins running from the cerebral cortex to the longitudinal sinus. These veins pass directly across the subdural space, unsupported, at right angles to the cortex and sinus. A slight displacement of the brain in the antero-posterior plane would be sufficient to cause rupture. The falx cerebri prevents lateral displacement of the brain. A blow on the front or back of the head is therefore liable to cause rupture of a vein and a subdural hæmatoma. Veins also run across the subdural space from the lateral sinus to the cortex over its convex surface, and these may rupture. Subdural clots are often bilateral which indicates the significance of blows in the antero-posterior plane. It is recommended therefore, that both sides of the brain should be explored at operation if the clot is not found on the side of the brain first exposed, or if recovery is not rapid after removal of a clot on one side. It is further suggested that the increasing severity of the headache is not due to further hæmorrhages, but to cerebro-spinal fluid being attracted into the site of the hæmorrhage by osmotic pressure. The clot becomes surrounded by a layer of mesothelial cells, the centre of the clot liquefies, the fluid is rich in protein, and the mesothelial cells, between the clot and the arachnoid, act as an osmotic membrane, the dura being thickened over the clot whereas the arachnoid is not so affected.

Frequently the blow on the head is so slight as to escape notice, and the headache appears after a latent period. A characteristic feature is the appearance and disappearance of the headache and the variation in the degree of drowsiness and confusion. In the later stages there may be signs of cerebral irritation and hemiparesis. Papillœdema is said to be uncommon and the pressure of the cerebro-spinal fluid is raised in only about one-third of the cases.

THE THROBBING TRUNK

"The little things are infinitely the most important."

A CASE OF IDENTITY

AT the end of October 1950 I was asked to see a man, fifty-nine years of age, on account of a peculiar restless throbbing or pulsating sensation at the back of the chest, which extended round to the sub-costal region in front. The general practitioner wrote that the patient had been previously diagnosed as suffering from obesity and neurasthenia, and that an X-ray of the chest showed no abnormality. He continued, "At first I thought that the diagnosis was neurasthenia and obesity, but I decided, in view of the unremitting character of the sensations, which were unaffected by sedatives, that further investigations should be done, ?polycythæmia ?aneurysm. There was a marked eosinophilia, but subsequent examination of the stools showed no ova of worms. A straight X-ray of the abdomen revealed no aneurysm, but the radiologist said that a negative report did not exclude the possibility. The W.R. is negative. If you can offer further suggestions the patient and I will be very much obliged."

The patient, Mr. H., gave me some further details. The throbbing in the back, extending over the lower ribs, and spreading outwards to the side of the chest on each side, had been felt intermittently since October 1947, and nearly continuously for the last three months. It appeared to be comparatively superficial and was much less noticeable when the patient was up, than when he was lying down or sitting in a chair. There was no tenderness of the skin. On further enquiry the patient added that the first doctor consulted made the diagnosis of a fatty heart, and prescribed slimming tablets. His weight fell from 14 st. 10 lb. to 12 st. in four months, but he became tired, irritable and jumpy. Investigations were now carried out in a country hospital but nothing abnormal was discovered. Finally, the patient consulted the doctor who referred him to me, after a course of vitamin B injections, given to "tone him," had failed to stop the throbbing.

The patient was still somewhat obese, being 5 ft. 6 in. tall, and weighing 13 st. 8½ lb. in his clothes. The ruddy complexion and congested ears suggested the possibility of polycythæmia rubra, but the patient said his face had been very red all his life. There was slight cardiac enlargement, with a systolic murmur over the aortic base. The blood pressure was 150/110 mm. Hg., and the pulse regular, 76. No abnormal signs were found in the lungs or abdomen. The urine contained no albumin and no sugar. Varicose veins were present in

the legs, and there was evidence of a healed varicose ulcer on the inner aspect of the left leg just above the ankle. Screen examination showed the heart shadow a little enlarged, with the aorta slightly uncoiled. The general practitioner sent me the result of the blood count made on October 5th: Red cells 4·5 millions per c.mm. Hb. 104 per cent. C.I. 1·15. White cells 7,000 per c.mm., polymorphs. 54 per cent, lymphocytes 20 per cent, monocytes 9·2 per cent, eosinophils 14·4 per cent, basophils 1·2 per cent, abnormal monocytes 1·2 per cent.

The patient was an intelligent man, able to describe his symptoms clearly. He had been a nurse in a mental hospital, and was now retired, although doing a little clerical work from time to time. In 1915 he received a shell wound in the right parietal region of the skull, and a portion of bone had been removed. In 1932 he suffered from rheumatic fever. Thinking that the diagnosis lay possibly between polycythæmia vera and polyarteritis nodosa, I advised him to come into hospital for investigations.

He was admitted on November 17th, and was afebrile during his stay of five weeks. The house physician and registrar made their clinical examinations and various tests were carried out, without enlightening results. The blood count on November 20th was Red cells 6·1 millions per c.mm. Hb. 117 per cent. C.I. 1·07. White cells 8,800 per c.mm., polymorphs. 58 per cent, lymphocytes 32 per cent, monocytes 5 per cent, eosinophils 5 per cent. This suggested the possibility of polycythæmia vera, but the bone marrow examination was normal and did not show the increase of erythroblastic and leucoblastic tissue met with in this condition. The sedimentation rate of the red cells was normal. The results of the further examinations were as follows:

Blood Wassermann reaction: Negative.

Renal function tests: Water elimination 35 per cent. of normal. Van Slyke urea clearance 63 per cent of normal. Blood urea 27 mg./100 c.c. Urine: No albumin, no casts.

Intravenous pyelogram: Normal.

Arm to tongue circulation time: Normal, 13 seconds.

Vital capacity: Low, 3,400 c.c.

Barium meal: No evidence of para-œsophageal hernia. Stomach and duodenum normal. Many diverticula in the descending colon. Some sclerosis of the right acetabulum, possibly due to early Paget's disease.

Fractional test meal: High acid curve.

Basal metabolic rate: Minus 17 (Aub du Bois).

Such was the state of affairs when I saw the patient again on December 1st. We were still completely in the dark as regards the diagnosis, and we could not explain "the restless throbbings." I now

examined him very carefully all over by palpation to determine whether there were any subcutaneous or intramuscular nodules suggestive of polyarteritis nodosa. I felt none. I sat the patient up and palpated the back in the area of the pulsating sensation. I could feel no nodules and no vessels. Then, without any particular reason, I drew my finger nail down the back and saw a very marked dermatographic reaction. First a red line appeared, then an extension of the red reaction spreading outwards along the line, and finally a raised white wheal in the centre of the red line.

A possible solution of the problem at once flashed across my mind, and turning to the house physician, I said, "I suppose this is a case of histamine sensitivity." I knew that histamine headaches had been described in 1941 by Horton (1) and by subsequent writers such as Butler and Thomas (2). These are thought to be due to dilatation of branches of the carotid artery in response to sensitivity to, or increased liberation of, histamine—in some cases an allergic manifestation.

We went into the history again more carefully. The patient said that the throbbing sensation was synchronous with the heart beat. Further, on lying on the right side the throbbing was on the right, when supine it was felt in the back, and on reclining on the left side the pulsations were now located to the left. When the patient was leaning back in a chair he noticed the throbbing in his back. The thumping attacks were sometimes precipitated by excitement, and they then passed off gradually. There was flushing of the face in the attacks, as so often occurs in histamine headaches.

A few words now about histamine may clarify the position from the theoretical aspect. Histamine is a vasodilator substance, of known chemical constitution, and widely distributed in the body, chiefly in the lungs and skin. It is β -iminazoly-ethylamine, and is formed from histidine by loss of CO_2 . It may be derived from histidine in food by the action of bacteria, and then absorbed from the intestine. It may also be produced locally in body tissues. It is destroyed by an enzyme histaminase. The amount normally present in the blood varies from 0 to 80 micrograms/100 c.c. The effect of an intradermal injection of a solution of 1/1,000 histamine acid phosphate is very similar to the line seen in dermatographia. There is a triple response; first a local reaction due to capillary dilatation, then a spreading red flare resulting from dilatation of arterioles, and finally a central wheal, caused by increased capillary permeability, and strictly confined to the area of the original red reaction. Whether or not the wheal itches depends upon the concentration of histamine injected, and in dermatographia the wheal does not itch.

The effect of pressure on the skin is to cause liberation of histamine in those who are sensitive. The histamine may be freed by an antigen-

antibody reaction, and its effect may be extrinsic or intrinsic. An intrinsic reaction is produced in the cells in which the histamine is liberated, as, for example, in the constrictor muscles of the uterus, the intestines or the bronchioles. The extrinsic reaction occurs at a distance from the cells in which the histamine is released, as in the vascular changes in the skin or nose when histamine is liberated from cells in the epidermis or nasal mucosa. Further, anti-histamine drugs are much more effective against extrinsic histamine reactions, such as urticaria and vaso-motor rhinitis, than against the intrinsic reactions resulting in bronchial spasm in asthma.

When I suggested that the throbbing was a manifestation of an extrinsic histamine reaction due to liberation of histamine from the epidermal cells as a result of external pressure causing vascular dilatation in subcutaneous arteries, my house physician said, "We were taught about this histamine business in physiology, but I did not think it could have any practical application." I recalled how when I was a student dermatographia was thought to be a manifestation of hysteria. We scratched the skin, thought it very strange and scratched it again.

We next proceeded to put the theory to the test by first determining whether the patient showed increased skin sensitivity to histamine, as compared with a normal control, in this case one of the clinical clerks, and then by investigating the effect of antihistamine drugs on the histamine response.

The histamine sensitivity test was carried out with a solution of 1 mg./1 c.c. of histamine phosphate. Five injections were made consecutively, the first two intradermally, the last three subcutaneously. Similar injections were made on the healthy control clerk. The results of the test were as follows:—

Histamine solution 0.03 mg. injected intradermally. The patient showed a local reaction with a triple response. The size of the reaction was 1 cm. in diameter, occurring eight minutes after the injection. The control showed no reaction.

Histamine solution 0.06 mg. injected intradermally. The patient showed a local reaction with a triple response, 2 cm. in diameter, two minutes after the injection. The control gave a similar reaction.

Histamine solution 0.12 mg. injected subcutaneously. The patient gave a local reaction with a triple response, 2.5 cm. in diameter. There was also a systemic reaction with throbbing of the trunk. The control gave a similar local reaction, but there was no systemic response.

Histamine solution 0.24 mg. injected subcutaneously. The local reaction in the patient was 3 cm. in diameter. There was a systemic reaction with flushing of the face and increased trunk throbbing. The control showed a similar local reaction, but no systemic response.

Histamine solution 0.48 mg. injected subcutaneously. The local

reaction was 3 cm. in diameter. The systemic response was more marked, with headache, flushing of the face, throbbing of the trunk and a purring sensation in the buttocks and down the legs. One hundred mg. of Anthisan were then given by mouth with a rapid reduction in the rate and intensity of the throbbing. The control showed a similar local reaction, with slight headache and flushing of the face. There was no throbbing of the trunk or legs.

There seemed, therefore, no doubt that the patient was unduly sensitive to histamine, and that its injection caused a reproduction of the throbbing sensations for which he had been admitted to hospital.

One morning, early in December, the patient woke with a moderate degree of throbbing around the trunk. By 10.45 a.m. the throbbing had almost ceased. The patient was then strapped firmly around the loins from the level of the twelfth rib to the iliac crests. By 11 a.m. the throbbing had increased very considerably, both in intensity and frequency. Fifty mg. of Thephorin were now given by mouth, followed by 25 mg. ten minutes later, and by 11.30 a.m. the throbbing was hardly noticeable. The experiment indicated that the throbbing could be increased by firm pressure around the trunk, and, when so produced, could be relieved by an anti-histamine drug. The final experiment consisted in determining the effect of anti-histamine drugs on the throbbing as it occurred spontaneously. It was found that the most satisfactory result was obtained by giving Benadryl mg. 50 on waking and again during the morning, with Thephorin mg. 50 and Phenergan mg. 50 at night. With this treatment the patient was almost completely relieved of his unpleasant sensations, and he returned home on December 21st, well pleased with his stay in hospital, and feeling better than he had done for years.

Eighteen months later I wrote to the patient, enquiring how he was. He replied that since leaving hospital he had been operated on for gall-stones, which had caused jaundice for several months. There was still a certain degree of throbbing, considerably less than on admission to hospital, but it was no longer relieved by the anti-histamine drugs. I suggested that he should come into hospital again to see if we could relieve him of his vascular symptoms by a course of histamine injections. This is sometimes referred to as desensitization, but as histamine is not an antigenic substance, desensitization as the result of histamine injections is a misleading term. Histamine-sensitive subjects have a lowered tolerance to histamine, and the results of histamine injections is to increase the tolerance, possibly by production of histaminase. Reports on the treatment of histamine headaches by histamine injections have been published by Horton (1) and by Eszenyi-Halasy (3) and I have myself treated cases with good immediate results.

On re-admission to hospital in June 1952, scratching the back

produced the same flare reaction with the central wheal, as was noted on the previous admission. The patient now stated that he felt a throbbing or purring sensation, chiefly in the back and made worse by pressure on the back. The throbbing coincided with the heart beat. It was not related to food, weather, or time of day, but it was not so noticeable after a hot bath.

The histamine skin sensitivity test was repeated. The intradermal injection of 0.005 mg. of histamine acid phosphate produced a flare at thirty minutes 8×7 cm. in area, with a central wheal 1.5×1 cm. in area. In a control student the flare and wheal were approximately half the size. The patient's resistance to histamine was now built up by daily injections of histamine acid phosphate, beginning with 0.1 mg. and working up to 1 mg. in ten days. By the time the injection had been increased to 0.8 mg. the patient said, "I feel very good. I notice nothing wrong. There is no throbbing and no purring." With the last injection of 1 mg. of histamine acid phosphate the blood pressure fell from 130/90 mm. Hg., at the time of the injection, to 110/80 mm. Hg. twenty minutes later. The pulse remained steady at 68 per minute. There was an immediate flushing of the face with the injections, and a throbbing occipital headache rapidly developed.

The patient left the hospital on July 7th free from all symptoms, and scratching the skin with the back of the finger nail no longer produce a wheal.

A few weeks later the patient wrote as follows: "I am feeling remarkably well. The throbbing and purring feeling has not returned."

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CONSTITUTIONAL JAUNDICE

“The novelty, rather than the greatness of things, tempts us to enquire into their causes.”

TRUTH AND ERROR

DOCTORS sometimes tell me they wish I would not describe rare cases, saying they are much more interested in the diseases commonly met with in their day-to-day practice. But every doctor is liable from time to time to be confronted with the unusual, and if he fails to recognize the uncommon case, and still more so if he is unaware of its existence, both he and his patient will be the losers.

The condition I am about to describe, constitutional jaundice, or, as it is sometimes called, constitutional hyperbilirubinæmia, is certainly a rarity, and it is not a disease. A Ceylonese doctor sought my opinion to explain the apparent paradox of perfect health and permanent jaundice. The patient was a young Indian, twenty-two years of age. About four years previously several of his friends had remarked on the yellow tinge in the white of his eyes. Having consulted many doctors in India, without obtaining a satisfactory explanation of the jaundice, he wished, while on a visit to England, to have the matter further investigated.

I found him a placid, heavily built man, weighing 13 st., but, owing to the natural colour of his skin, the jaundice was only detectable in the conjunctivæ. Neither liver nor spleen was enlarged, and no abnormal physical signs were detected on clinical examination. The urine was clear, rather dark brown in colour, with a sp. gr. of 1·026, containing no albumin and no sugar, but giving a positive reaction for bilirubin. The patient told me that as long as he could remember his water had been dark, and he never recollected passing a limpid stream. His mother had noticed the unusual colour of his urine since he was very small, but there was no family history of jaundice.

Various laboratory examinations were carried out during the few days he was in hospital. *Urine:* Bilirubin present. Urobilinogen and urobilin present, but not in excess. No casts. *Blood count:* Red cells 5·75 millions per c.mm., Hb. 106 per cent, C.I. 0·9, reticulocytes 0·6 per cent, normochromia, White cells 7,400 per c.mm., polymorphs. 47 per cent, lymphocytes 36 per cent, monocytes 6 per cent, eosinophils 11 per cent. *Sedimentation rate:* 3 mm. at 1 hour (Westergren). *Fragility of red cells:* Normal. *Serum:* Bilirubin 4·1 mg./100 c.c. (normal 0·1–0·8 mg./100 c.c.). *Direct van den Bergh reaction:* Positive. Plasma proteins 7·6 G. per cent. Albumin 5·5 G.

per cent. Globulin 2.1 G. per cent. Serum cholesterol 220 mg./100 c.c. *Alkaline phosphatase*: 3.5 King-Armstrong units/100 c.c. *Cephalin-cholesterol*: Plus 1. *Colloidal gold*: Negative. *Thymol turbidity*: 1 unit.

The liver function tests, apart from the van den Bergh reaction, were therefore normal. *Fæces*: No ova, cysts or parasites. *Barium meal*: A filling defect was seen in the pyloric antrum, containing a central dense blob of barium. This was present in a repeat barium meal and was thought to be a small polyp with a central ulcer. The patient had no symptoms of indigestion. The examination showed, therefore, no evidence of a hæmolytic jaundice, for there was no splenomegaly, no reticulocytosis, no anæmia, and no increased fragility of the red cells, and I was able to reassure the patient that the jaundice was innocuous, although it was likely to be permanent.

Comment. Cases of this nature have been reported under various names. Gilbert *et al.* (1) in a series of papers between 1907 and 1917 described a condition in which the blood bilirubin was raised, which they called simple familial cholæmia. These cases were subsequently considered to be examples of acholuric jaundice. Parkes Weber (2) in 1916 recorded the case of a man who was permanently jaundiced, but otherwise in good health. Hijmans van den Bergh (3) in 1933 called the condition constitutional hyperbilirubinæmia. Rozendaal *et al.* (4) in 1935 described forty-four cases of constitutional jaundice, in which there was no evidence of hæmolytic disease, and in four of which there was no family history of jaundice. Damashek and Singer (5) in 1941 called the condition "Familial non-hæmolytic jaundice," since there was no increase in stercobilin excretion. Barrie (6) in 1946 has reviewed the subject and he described a case in which there was no family history of jaundice and no increase of stercobilin excretion.

It has been suggested that the hyperbilirubinæmia is partly due to a raised hepatic threshold for the passage of bilirubin from the blood into the bile capillaries, and partly to the variations in the rate of hæmolysis. In the previously recorded cases the direct van den Bergh reaction has been negative, the indirect reaction being positive. In the case I have described above the direct reaction was positive, suggesting some disturbance of function of the liver cells.

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THE FOSTER KENNEDY SYNDROME

“ To hunt after truth is properly our business, and we are inexcusable if we carry on the chase impertinently and ill.”

OF THE ART OF CONFERRING

EARLY in May 1949 I was asked to see a single woman, forty-seven years of age, suffering from rheumatoid arthritis. She was to come by ambulance from her home town, fifty miles away. The patient arrived three-quarters of an hour late, partly owing to the fact that she had been sick in the ambulance, and partly because the driver did not allow sufficient time for the journey, as, in my experience, is not uncommon with ambulance drivers. On entering the hall, looking very ill, the patient said to the doorman, “ I am going to be sick.” The latter, unperturbed, and without a moment’s hesitation, reached behind her for the pewter salver, and holding it out was just in time to receive the vomit.

I found the patient well nourished, but rather pale. The rheumatoid arthritis began seven years previously in the knees, and spread to the feet, elbows, back, shoulders, wrists and hands. It was now most painful in the neck and left temporo-mandibular joint. Six years ago a course of monthly gold injections was given lasting a year. Two or three subsequent courses were administered after an interval of three months, the last injection being in July 1948. The general practitioner sent a letter saying, “ This patient has chronic rheumatoid arthritis for seven years. She had a course of gold therapy which caused some anæmia. The eye specialist here states that her vision is 6/60 left eye. She has some swelling over the left maxillary antrum, but the E.N.T. specialist here states there is no sinus infection. At present she is very troubled about her sight. Could this possibly be an early disseminated sclerosis ? ” This was not a very informative letter, in view of the reports I subsequently obtained from the eye specialist.

As the patient was sitting opposite me at my desk, she said she could detect there was a figure in front of her, but could not distinguish my features. On rough testing I found that with the left eye objects such as a pencil or pen could be recognized, and fingers could be counted; with the right eye fingers and objects were blurred and could not be distinguished. I next enquired about the vomiting, and was told the patient was not subject to train or car sickness, and had not vomited during the last year until coming to see me in the ambulance. Frontal headaches, of a thumping nature, had been noted for the last two months. These were aggravated by bending down, by straining at

stool, and by coughing. The left eye was slightly more prominent than the right, a fact which her sister had noticed recently. The rheumatoid arthritis was not now very troublesome, being a minor complaint compared with the loss of sight. The heart, lungs, urine and blood pressure were found to be normal. I could detect no evidence of disseminated sclerosis, but on examining the fundi I found on the right side papillædema to the extent of 4 D, and on the left optic atrophy, the disc being very pale except on the nasal side, where it was a little blurred. I had seen two cases previously of the Foster Kennedy syndrome (1), characterized by optic atrophy in one eye, and papillædema in the other, and indicating the presence of a frontal lobe tumour or abscess on the side of the atrophy, and so I wrote to the doctor saying that I thought the patient was most probably suffering from a left frontal lobe tumour, and recommending her to come into hospital for further investigations.

The patient was admitted to hospital a few days later, when an attempt was made to unravel the somewhat involved and contradictory statements about the failure of sight.

This was her story. At the end of June 1948 the sight was very good. In July there were one or two episodes, lasting only a few seconds, of hazy vision, more marked on the right side than on the left. Thus, on walking into a room in which her sister was sitting on the patient's right side, she noticed that she could not see her clearly for a few seconds. These episodes became more frequent in August and September; in September the sight was constantly affected, and although able to read and distinguish people, vision appeared a little dim. In October 1948 an eye specialist was consulted and glasses were ordered. In December the eye specialist was again consulted, as the patient now could not read, and the glasses had not yet arrived. I wrote to the eye specialist asking for his findings at this date, and his report is given later. About this time she discovered that if the right eye was covered over, she could hardly see at all with her left eye, although when admitted to hospital the following May, we found the vision was better in the left eye than in the right. In January 1949 the patient said that she could see fairly clearly with the right eye, but could only distinguish light and shade with the left eye. In February 1949 an infection developed in the left maxillary antrum, antral puncture was performed but no pus was found, and one penicillin injection was given. The antritis was well in two weeks and the patient affirmed that she found by her own tests of covering each eye alternately, that the vision improved very much in the left eye after the antral puncture. Her sister, however, said that this was not so. Perhaps the patient was a better judge of this than her sister, although the alleged improvement of vision in the left eye must be considered a matter of

uncertainty. About the middle of April 1949 vision deteriorated in both eyes, but much more in the right than in the left.

On admission to hospital the patient could just distinguish between light and darkness with the right eye. With the left eye she could read letters $\frac{3}{4}$ in. high, but not letters $\frac{1}{2}$ in. high. She could distinguish colours with the left eye, count fingers, and differentiate between a pencil and a pen. She was not able, however, to recognize persons, although seeing their figures.

The patient still complained of frontal headaches, of pain in the back of the neck, and of feeling very nervous since last November, which she attributed to her failing sight.

The pupils were equal, of medium size, the reaction to light was normal in the left eye, but the right pupil did not constrict so much as the left. The reaction to accommodation was equal in each eye.

No other abnormal signs were found in the central nervous system,

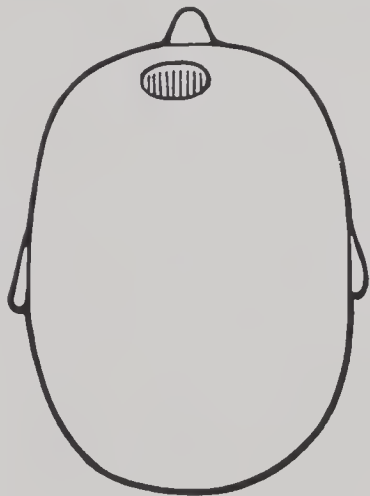


FIG. 24. Skull from above showing electro-encephalographic localization of tumour.

beyond diminution of smell, hyposmia rather than anosmia, on the left side. The electro-encephalogram supported the diagnosis of a left frontal tumour, the report being as follows: "The alpha rhythm was predominantly at 8 c./sec. and of moderate voltage ($30 \mu\text{v.}$). There was considerable theta activity, and also slow wave activity at 3 c./sec. from all areas, but most marked parieto-occipitally. No phase reversals were seen from these waves, i.e. they do not arise from a definite focus. Persistently throughout both recordings, on May 18th and 19th, there was over the frontal lobes an abnormal saw-toothed wave of maximal amplitude $50 \mu\text{v.}$, and varying in frequency from 2 to 3 c./sec. The phase relationships of these waves and the distribution of voltage are consistent with a focus of activity in the mid-line, possibly a little to the left, and very deep in the frontal lobes, as shown in the diagram (Fig. 24). Conclusion: Such a record could be obtained if there were a tumour deep in the frontal lobes in the mid-line, or a little to the left of the mid-line."

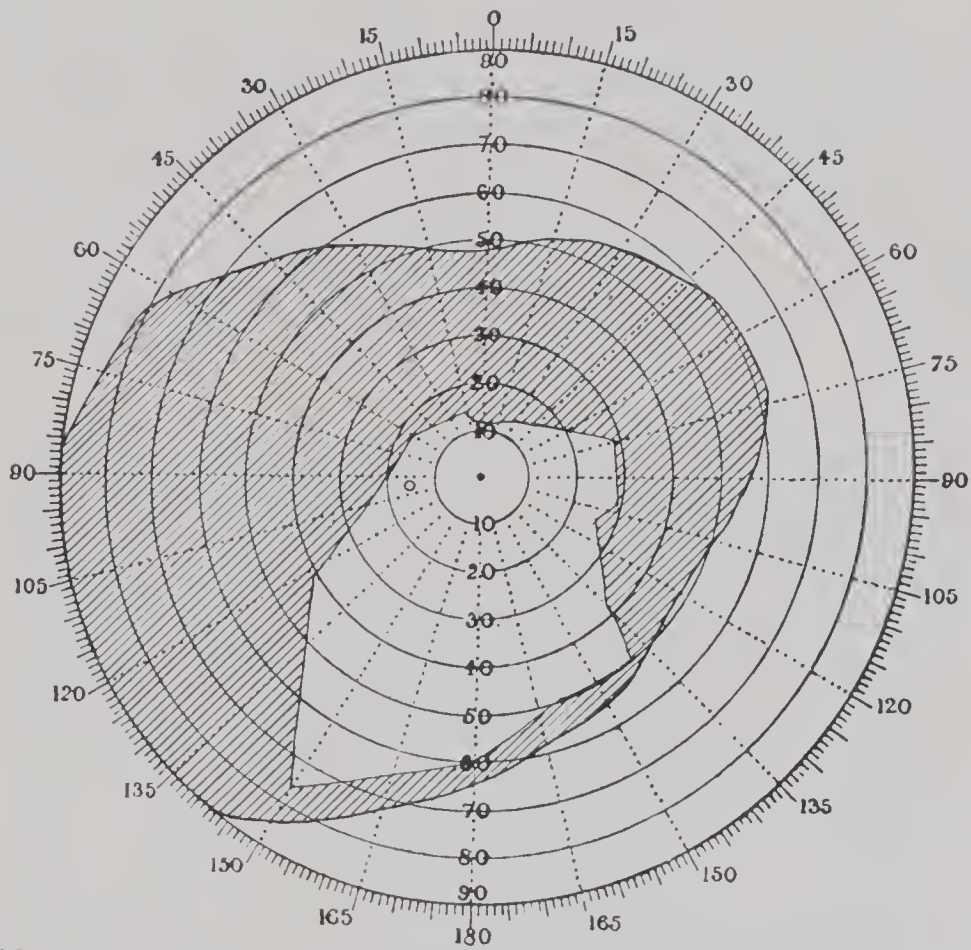


FIG. 25. Left visual field. Two-degree white test object not seen in shaded area.



FIG. 26. Norma lateralis of skull showing beaten-silver appearance and erosion of dorsum sellae.

The ophthalmologist reported: "Right papillœdema about 4-5 D swelling. Vessels obscured by œdematous nerve fibre layer. Left optic atrophy and subsiding papillœdema. Right vision: Hand movement at 3 in., no peripheral field. Left field (see Fig. 25). Left vision: Less than 1/60 with — 0.75 cyl. Axis horizontal."

In the meanwhile we thought that the X-ray examinations had thrown further light upon the case. The vault of the skull showed a



FIG. 27. Norma frontalis of skull showing well marked shadows of the wings of the sphenoid in right orbit, and faint shadows of the wings of the sphenoid in left orbit.

marked beaten-silver appearance due to thinning of the bone by the increased intracranial pressure. The X-ray report stated: "The lesser wing of the left sphenoid is destroyed, and there is also destruction of the dorsum sellæ. There is an area of destruction in the occipital bone around the torcular Herophili. The destruction in the left sphenoidal lesser wing is almost certainly a deposit; the area in the occipital bone may also be deposits" (see Figs. 26 and 27). If you will look at the X-ray showing the norma frontalis of the skull (Fig. 27)

you will see in the left orbit what appears to be destruction of the lesser wing and of the orbital surface of the greater wing of the sphenoid, the bone on each side of the sphenoidal fissure being eroded. An X-ray film of the chest showed a circular shadow in the right cardio-phrenic angle (see Fig. 28), which was seen to be placed anteriorly in the oblique view. It was suggested that there was a primary carcinoma of the lung with secondary deposits in the skull. The erosion of the



FIG. 28. X-ray of the chest showing circular shadow in right cardio-phrenic angle.

sphenoid indicated the cerebral tumour was on the left side. The remaining bones of the body were X-rayed, but no deposits were noted elsewhere. No symptoms or clinical signs pointing to a lung lesion could be found. The temperature occasionally rose to 99° F. in the evening, and the pulse rate varied between 60 and 88. Blood count: Hb. 111 per cent, White cells 5,500 per c.mm., polymorphs. 57 per cent, lymphocytes 33 per cent, monocytes 10 per cent. Sedimentation rate: 6 mm. at 1 hour (Westergren). Alkaline phosphatase: 10·8 King-Armstrong units/100 c.c. Blood proteins: Normal.

Some of the doctors who examined the X-ray films of the chest considered the possibility that the shadow might be due to a simple cyst or one of the other recognized causes of rounded opacities in the right cardio-phrenic angle, such as humping of the diaphragm or a diaphragmatic hernia. Against the diagnosis of primary carcinoma of the lung, with secondary deposits in the brain were (1) the absence of signs or symptoms of carcinoma of the lung, (2) the normal sedimentation rate of the red cells, and (3) the mental clarity of the patient. On the other hand I have seen a patient with secondary carcinoma of the brain in which the primary growth in the lung was small and giving rise to no symptoms, and which was not detectable on radiological examination, either in the postero-anterior or lateral films, owing to the growth being situated at the lung root and the patient having such marked scoliosis that it was hidden by the spinal curvature.

A neurologist reported: "Right eye: No perception of light. Gross secondary optic atrophy, with some swelling still present. Left eye: Visual acuity less than J 20—field contracted, but this is general. Optic atrophy almost primary in type, with a little nasal œdema. There are no other abnormal physical signs beyond relative hyposmia on the left, but there has been a left antrostomy. The patient is well orientated and has no gross intellectual impairment. The clinical picture is that of a chronic mid-line lesion." Unfortunately the X-ray films could not be found when the neurologist examined the patient.

A neurological surgeon gave the following report: "It is very difficult to obtain precise details in the history. She has obviously been an ailing woman for some years. Visual deterioration dates from last autumn and began in the left eye, with ? improvement after left antral puncture performed for no very obvious reason. Now her left eye is the better one, but she has been unable to read for nine months and now can distinguish people only as vague shapes. Never any diplopia. Has had left frontal and occipital headache, but is vague as to duration and time relationship. No weakness of limbs other than that associated with rheumatoid arthritis. No paræsthesia. No nasal discharge. No cough. Examination: There is mental deterioration here and I do not think it is related to her blindness. Discs: Right, gross papillœdema with much greyish exudate. Left, secondary optic atrophy. Eye movements: Diminished lateral deviation to the right whilst the left eye turns up and in. Pupils: Right > left, both show sluggish reaction to light. Proptosis of eyes of moderate degree, right > left. Mild right central facial weakness. No other abnormal neurological signs. X-rays: Absorption of greater wing of sphenoid on left side. Posterior clinoids eroded. Marked beaten-silver appearance. The areas in the occipital region are due to enlarged diploic vessels and are not destructive.

"*Comment.* I am surprised to find a woman as well as this patient is, suspected of intracranial secondaries from a primary lung neoplasm and should regard her as having a meningioma of the greater wing of the sphenoid had I not been aware of the chest condition. Is it possible that this is of other pathology, or alternatively that a primary intracranial neoplasm has produced a chest secondary? I agree that the prognosis as to recovery of sight is bad, whatever the cause of the blindness, and, as she has no severe headache, there seems at present no indication for intervention. I think a lumbar puncture might clarify the picture."

This was done on May 25th. The pressure of the cerebro-spinal fluid was raised to about 400 mm. C.S.F. The fluid was clear, and 10 c.c. were removed for examination. The protein content was high, 500 mg./100 c.c. The sugar was normal, 70 mg./100 c.c., and the chlorides were also normal, 700 mg./100 c.c. The Wassermann reaction on the fluid was negative. The cells numbered less than one lymphocyte per c.mm.

Immediately after the lumbar puncture the patient complained of severe frontal throbbing headache which was relieved in about an hour by placing the foot of the bed on blocks and giving a codein mixture by mouth.

In the evening the headache returned, the patient felt sick and vomited about 1 oz. of clear green fluid. The next day the general condition appeared to improve; the patient was less nervous and brighter mentally, but during the following afternoon she vomited 12 oz. of bile-stained fluid and complained of very severe frontal headache. As she lay in bed with the eyes closed, it was noticed that both upper eyelids looked a little œdematous, and the expanse of eyelid, from above downwards was a little increased, due to slight bilateral proptosis. Trembling of both arms was now very noticeable, a symptom of which the patient had complained since the vision began to fail. She said that the trembling was not always present, and that it was aggravated by nervous tension.

There is little further to report clinically; during the next few days the patient sank into semi-coma and died five days later. On the last evening, the respirations were slow, 7 per minute, and of the Cheyne-Stokes type. The pulse was 56 per minute, with an irregular volume, but regular rate. Shortly before death the patient became conscious, spoke a few words and complained of headache and of trembling violently all over.

Post-Mortem Findings. I was present at the autopsy held on June 3rd. On opening the thorax it was at once seen that the patient had not a carcinoma of the lung. Lying in the angle between the right lower border of the heart, the right lung and diaphragm was a

yellowish-coloured translucent cyst, $2 \times 1\frac{1}{2} \times 1\frac{1}{4}$ in., containing clear fluid (see Fig. 29). The cyst was mobile, but attached medially to the fat in the cardio-phrenic angle. It overlay a small portion of the antero-medial aspect of the middle lobe of the right lung causing pressure collapse. On firm digital pressure no fluid could be expressed from the cyst into the pericardial cavity or mediastinum. On opening the pericardium there was no evidence of communication between it and the cyst. The fluid content was clear and straw-coloured, about

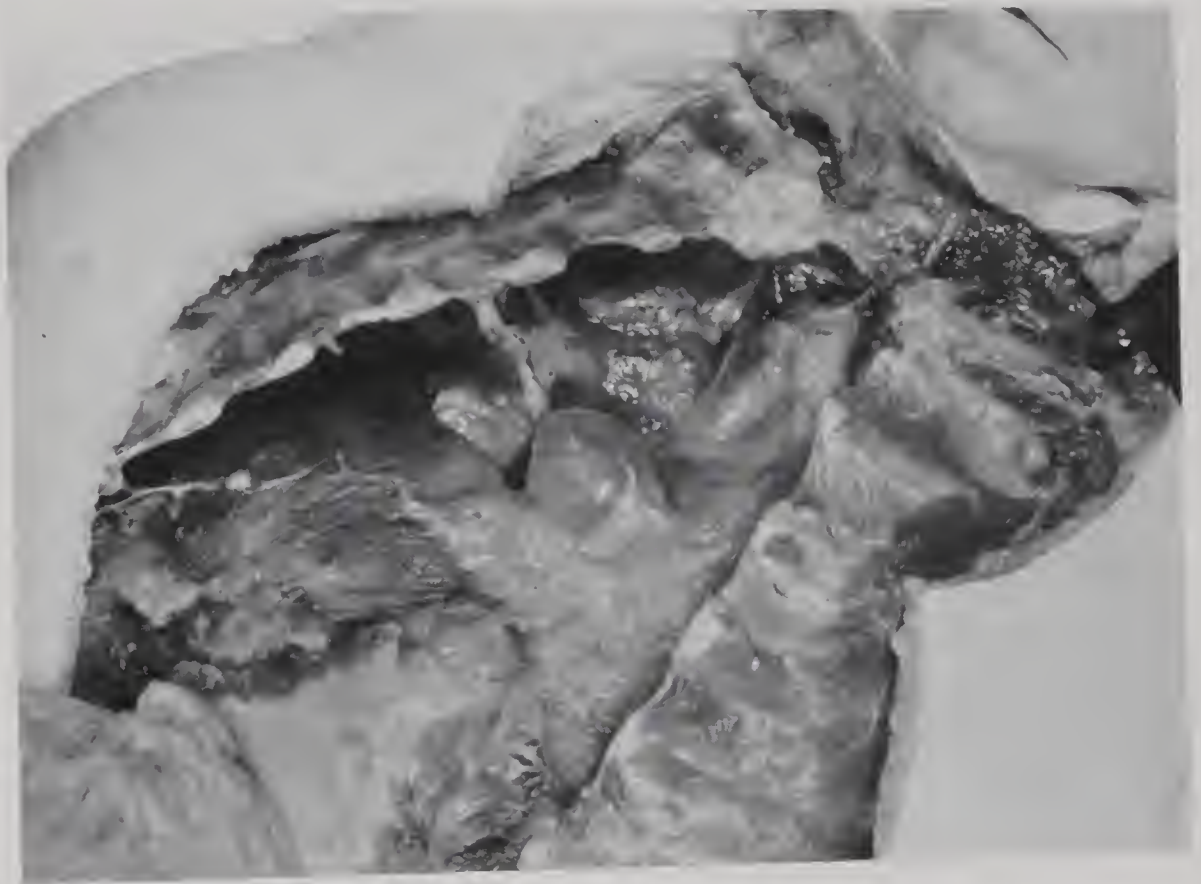


FIG. 29. Post-mortem appearance of thorax, showing "spring-water" cyst in right cardio-phrenic angle.

20 c.c. in volume, with 0.24 G./100 c.c. protein. No cells were present but a few degenerate crystals, ? cholesterol.

It was a spring-water cyst, so-called from the clearness of the fluid it contains. Other names which have been applied to these cysts are serosal cysts, simple mediastinal cysts, pleuro-diaphragmatic cysts, pericardial coelomic cysts, mesothelial mediastinal cysts, and pericardial cysts. The cyst is thought to arise from a fold in the advancing pleural cavity at the 15 mm. embryonic stage. The fold is cut off, and connective tissue laid down around it. It is lined with simple squamous epithelium, and the cyst bulges towards the pleural space. Some authorities have stated that the cyst only occurs in the inferior anterior mediastinum, but Barrett and Barnard (2) have reported it in the

superior mediastinum. At times it is seen on screen examination to pulsate with each beat of the heart, and it may change in shape in films taken with inspiration and expiration. In considering the differential diagnosis, on radiological examination, the following conditions should be thought of: 1. A fat pad in the cardio-phrenic sulcus. 2. A lipoma. 3. A dermoid. 4. A teratoma. 5. A hamartoma.

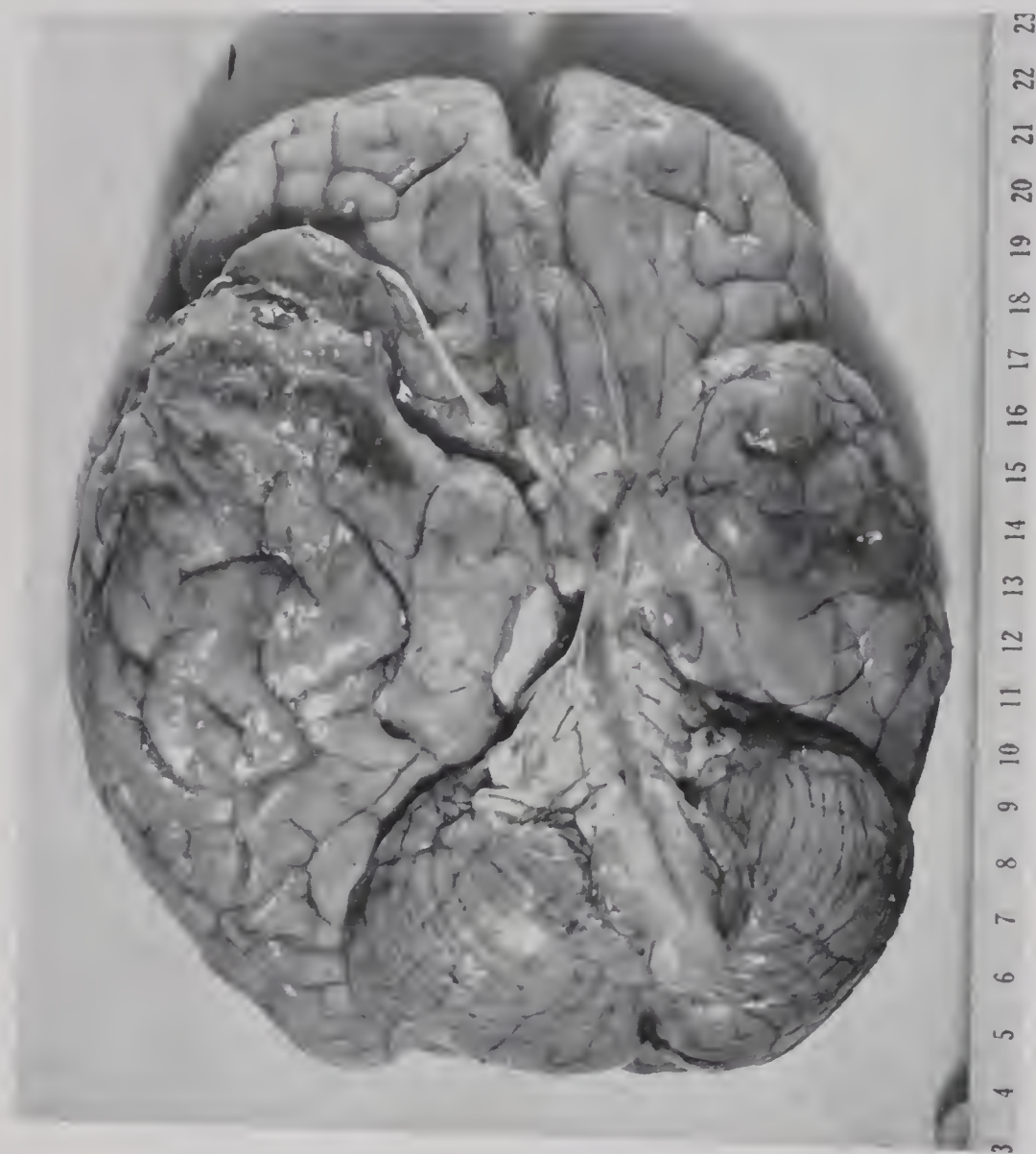


FIG. 30. Base of brain showing meningioma arising from right Sylvian fissure.

6. A neurofibroma. 7. A diaphragmatic hernia of the intestine, liver or kidney. 8. A hump of the antero-medial portion of the diaphragm. 9. A cardiac aneurysm. 10. Unilateral sacculated pericarditis. 11. Primary carcinoma of lung. 12. Secondary carcinoma of lung. An interesting paper on the subject was published in 1948 by Cooper, Archer and Mapp (3).

With this post-mortem finding the diagnosis of primary carcinoma of the brain appeared somewhat less likely, and on opening the skull

the dura everywhere appeared tense and bulging, and the convolutions of the cerebral hemispheres were flattened. There was a fairly well marked pressure cone. The tumour was found, not as was expected on the left, but on the right side of the brain. It lay on the under surface of the brain and arose from the dura mater in the Sylvian fissure between the frontal and temporal lobes (see Fig. 30). It was firm, about 2 in. in diameter, and presented the appearance of a meningioma. The tumour was adherent anteriorly to the thin edge of the lesser wing of the sphenoid on the right side, which defines the posterior border of the anterior cranial fossa. There was erosion of the greater and lesser wings of the right sphenoid and of the right anterior middle and posterior clinoid processes and of the dorsum sellæ. No hæmorrhage had occurred into its substance. The tumour projected medially causing pressure and adhesions over the right optic nerve and it entered the superior orbital fissure on the right side. Further, it displaced a portion of brain tissue to the left, and this, by compressing the left optic nerve as it pierced the dura mater to enter the optic foramen, would cause the brunt of the pressure from the bone to fall on the temporal side of the nerve. On the inner table of the occipital bone, corresponding with the small translucent area seen in the X-ray of the skull, there was an area of erosion, about 0.5 cm. in diameter, and a portion of cerebellum had herniated into the hole. Histological examination showed that the tumour was a meningioma. Further, there was a small portion of the cerebellum covered by dura filling a deficiency in the occipital bone. This deficiency was probably congenital. There was no evidence of a vascular, inflammatory or neoplastic lesion.

The bones of the vault of the skull were seen on transillumination to be a little thinned, hence the radiographic beaten-silver appearance. The tumour did not invade the brain substance, and it appeared that it could have been removed surgically.

When I enquired what was the explanation of the discrepancy between the X-ray and the post-mortem findings, namely why the sphenoid appeared eroded radiologically on the left side, whereas the erosion actually was on the right side, I was told by my house-physician that it was assumed that the film of the skull was incorrectly labelled, the right side being the left, and vice versa. It was too late now to check the correct side of the film by examining the position of the teeth in the lower jaw.

The deterioration of the patient's condition after the lumbar puncture was due to the formation of a medullary cone, as it was not caused by a hæmorrhage into the tumour. Death was considered to result from the high intracranial pressure affecting the vital centres in the medulla.

Comment. It now remains to consider how the clinical symptoms and signs of the visual failure can be explained by the post-mortem findings. When I first saw the patient three weeks before her death, the difference between the appearance of the two fundi was so striking, that bearing in mind Foster Kennedy's publication I had little doubt that a tumour was present in the left frontal lobe. The left disc presented the appearance of a primary optic atrophy—the disc was very pale, the edge was sharp, except on the nasal side where it was blurred, and the retinal arteries were only slightly attenuated. The right fundus on the other hand, presented the typical features of a severe degree of papillœdema. Reviewing the other findings, the patient first noticed failure of vision in the left eye, and if there was a temporary recovery of vision in this eye, as was suggested by the patient, but denied by her sister, this could be accounted for by a variation in the size of the tumour, with a consequent variation in its pressure effects, as described later. The vision in the right eye subsequently failed—to a much greater degree than in the left eye, so that during the last few weeks she was to all intents and purposes blind in the right eye, although still possessing some central vision on the left side.

I wrote to the ophthalmic surgeon who saw her on October 8th, 1948, when the patient complained of failing vision in the left eye, and he told me that he found the vision was 6/9 uncorrected in each eye. The left disc and vessels appeared normal; the right disc was pale and the retinal arteries somewhat attenuated, a condition that he took to be a primary optic atrophy. He advised that she should see a neurologist, but as far as I know she did not do so until six months later, after admission to hospital.

The post-mortem findings indicate there was at this time pressure from the tumour on the right optic nerve. On December 9th, 1948, the ophthalmic surgeon again examined her, when she complained that vision was worse, particularly in the left eye. The vision was now, left, less than 6/60; right, 6/9. He found there was primary optic atrophy on the left side, and papillœdema on a background of optic atrophy on the right side. The post-mortem findings suggest that the displacement of the brain by the tumour to the left had nipped the nerve with pressure on it by dura mater and bone just before it entered the optic foramen, causing the atrophy, whereas the pressure on the right side was not of so severe a nature, and had resulted in a secondary papillœdema.

Whether or not this is the true explanation, this case demonstrates that the findings at the second examination of the ophthalmologist, and also when I examined the patient in the following May, did not allow the tumour to be located correctly, as according to Foster

Kennedy, it should have been situated on the side which showed the optic atrophy uncomplicated by papillœdema.

Foster Kennedy (1) published his paper entitled "Retrobulbar neuritis as an exact diagnostic sign of certain tumours and abscesses in the frontal lobe" in 1911. In discussing the diagnosis of expanding lesions of the frontal lobes he writes: "The sign to which I wish to draw attention is the occurrence of true retrobulbar neuritis with the formation of a central scotoma and primary optic atrophy on the side of the lesion, together with concomitant papillœdema in the opposite eye." There are two possibilities, he says, when the tumour arises in the under surface of the frontal lobe. The tumour may in its early stages, press directly on one optic nerve causing primary optic atrophy of the macular fibres with loss of central vision, followed, as the intracranial tension rises, by papillœdema in the other eye. Alternatively, if the expanding lesion is situated in the substance of the frontal lobe not at first implicating the optic nerve, there is first a rise in the intracranial tension causing bilateral papillœdema, followed by ipsilateral optic atrophy affecting first the temporal half of the disc, as the tumour or abscess expands to press on the underlying optic nerve. The vision will now rapidly diminish on the ipsilateral side, while on the contralateral side the vision will remain good for some time. Dr. Kennedy's account is based on six cases, four of which he observed while resident medical officer at the National Hospital, Queen Square, London, and two were seen later in New York. In three of these ipsilateral optic atrophy occurred before there was time for papillœdema to develop, in the other three cases the optic atrophy followed the papillœdema.

If the chest had not been X-rayed in the case I have described it is probable that a diagnosis of meningioma would have been made, as was suggested by the neurological surgeon. If the patient had been seen by a neurologist six months earlier, the tumour might have been removed, and sight and life preserved. If the surgeon had decided to operate in the later stages, after preliminary decompression, would the lesion have been localized to the right side, where the papillœdema was intense, or would reliance have been placed on the teachings of Foster Kennedy, on the electro-encephalographic findings, and on the side of the erosion of the sphenoid, as indicated by the X-ray of the skull? Would the skull have been opened on the left side, only to draw a blank? An air encephalogram would probably have decided this point, the ventricular system being displaced away from the side of the tumour. Should this really be considered as a case illustrating the Foster Kennedy syndrome, as there was no central scotoma in the atrophic eye, and was it possible to test adequately for this when the patient was in hospital, as she was then so very ill?

These and other matters are subjects for reflection.

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GOITROGENOUS ASTHMA

A SINGLE woman, twenty-three years of age, was sent to me in December 1948 because she was faced with retirement from work on account of asthma and chronic bronchitis. There was no history of illness in the family, and the patient had never suffered from hay fever, pneumonia, pleurisy, or any allergic or pulmonary disease.

During 1947 she developed symptoms of thyrotoxicosis and attended the out-patient department of a provincial hospital. In December 1947 she was admitted to hospital with a view to operation; however, after further observation, thyroidectomy was not considered to be necessary, and the patient was discharged. A month later she was admitted again to the same hospital and given a course of thiouracil, and this treatment was continued as an out-patient until March 1948. In May 1948 she began to be wheezy for the first time in her life, and during the rest of the year was off duty with what was diagnosed as asthma and bronchitis.

I examined the patient on December 2nd, 1948, and reported as follows: "Her general condition is good, height 5ft. 5 in., weight (clothed) 10 st. 1 lb. The throat is normal. The tongue is slightly furred. I can feel no enlarged lymphatic glands. The fingers are not clubbed. The teeth are sound. The pupils and knee-jerks react normally. There are no eye signs of Graves' disease, no tremors, and the skin is dry. The pulse is slow, 78, regular. The blood pressure is 120/80 mm. Hg. The heart is not enlarged and there are no murmurs. The breath sounds are wheezy with some rhonchi. She has a nodular goitre and on screen examination the superior mediastinum is not quite clear. Further, the dyspnoea is relieved by sitting forward.

"It seems possible that there is pressure on the trachea either in the neck or from a retrosternal goitre, and, if so, the nodular goitre has probably enlarged as the result of the thiouracil treatment. I am recommending her for admission to hospital for further examinations. In the meanwhile I think the decision about her retirement should be postponed."

She was admitted to hospital in London under my care on December 30th, 1948, and on admission her weight was 10 st. 1 lb., pulse 130, blood pressure 130/75 mm. Hg. and the circumference of the neck 14 $\frac{1}{4}$ in. The house physician noted that there was a moderate diffuse soft enlargement of the thyroid, equally of both lobes, and that no adenoma could be felt. Respiration was wheezy and numerous rhonchi were present over both lungs. The following investigations were carried out: *Bronchoscopy*: The glottis is small, and the cords are normal. The trachea is deviated to the left, but no distortion is

seen. The appearances of the bronchi suggest spasm. *Blood count:* Hb. 102 per cent. Leucocytes 8,300 per c.mm., polymorphs. 66 per cent, lymphocytes 25 per cent, monocytes 4 per cent, eosinophils 5 per cent. *Blood cholesterol:* 232 mg. per 100 c.c. *X-ray of chest:* Nil abnormal seen in heart or lungs. Tomograms were taken and these showed an indentation of the anterior wall of the trachea by an enlarged thyroid. The trachea was also slightly deviated to the left. No retrosternal goitre was seen. *X-ray sinuses:* Mucosal thickening of both frontal sinuses and both antra, more marked on the left than on the right. The ethmoid cells are poorly developed and show poor pneumatization. *X-ray teeth:* Slight alveolar absorption of the upper and lower jaws. Otherwise no dental abnormality detected.

There was no clinical evidence now of thyrotoxicosis beyond the tachycardia, which was not present when I first examined her. The blood cholesterol figure was not low, as one expects in thyrotoxicosis.

While these investigations were being carried out the patient had about one attack of breathlessness a day, and the house physician reported that it came on suddenly and appeared to be typically asthmatic. He noted that she found it difficult to *take in* a breath! The attacks were relieved in a few minutes by Neo-Epinephrine, mg. 20 tablet dissolved under the tongue. While asleep she often had a pronounced wheeze in the throat, which did not disturb her and stopped as soon as she awoke. Estimation of the basal metabolic rate was difficult, owing to the great tendency of the patient to develop an asthmatic attack when subjected to the test. The B.M.R. was first reported as being +7, which appeared to agree with the clinical findings. Two weeks later, despite the administration of iodine, and after several readings it was decided that the B.M.R. was raised to +25. These unusual results tended still more to confuse the issue. A suggestion was made by the biochemist that the increase in the B.M.R. was an adrenaline effect. The patient, however, had not taken any Neo-Epinephrine for over twenty-four hours before each B.M.R. determination, and it is well known that the adrenaline effect of raising the B.M.R. passes off in a few hours. Thus Sandiford (1) who investigated this question in 1920 stated in her paper: "Following the injection of adrenaline the height of the metabolic curve is reached in approximately from ten to thirty minutes and has returned to its basal level in about two hours." She had found that after the injection of 0.5 c.c. of 1 in 1,000 adrenaline subcutaneously, the average maximum rise in the B.M.R. in four normal people was 18, and there was a greater increase in cases of Graves' disease.

I now asked a surgeon to see the patient and he considered that she was suffering from thyrotoxicosis and that thyroidectomy should be performed. Neither my house physician nor the surgeon would

agree with me that the asthma was in any way connected with the enlargement of the thyroid.

The patient went home for three weeks to await operation, and on re-admission on March 11th was found to be sleeping much better, only having to take Neo-Epinephrine about every third night. There was now more definite evidence of thyrotoxicosis. The pulse was 120, the rate rising quickly on emotion or exercise. The B.M.R. was +28 and the weight had fallen to 9 st. 9 lbs. A fine tremor of her hands was now noted. The blood cholesterol also had fallen to 171 mg. per 100 c.c., which supported the diagnosis of thyrotoxicosis. On March 23rd, after a course of pre-operative iodine, a sub-total thyroidectomy was performed. The thyroid was smooth, firm and vascular and both lobes were enlarged. A small adenoma was found in the isthmus, but there was no retrosternal portion. The adenoma was presumably pressing on the trachea, as had been shown by bronchoscopy and by tomography. Two days later the pulse was 164 and respirations 30. A tachycardia of 140 continued, together with a temperature of 100° F. for three days, and it was considered that she had a mild thyrotoxic crisis. The pathological report on the thyroid was: "The nodular goitre shows areas of hyperplasia with marked colloid deficiency and moderate lymphoid hyperplasia," thus confirming the diagnosis of thyrotoxicosis, and also of nodular goitre.

A repeat B.M.R. on March 31st, 1949, gave a reading of +10. The patient attended the out-patient department in May 1949, her weight was now 10 st. 2 lbs. She was much better and had been troubled by only one attack of asthma.

I saw the patient again on July 14th, 1949. She now felt very much better and was quite free from attacks of asthma. She said "It feels so much easier round my throat now, I feel I can breathe." I could not find any abnormal signs and advised that she would be fit to start work again in August.

Comment. This is an example of a case in which experience was not fallacious. I probably should not have diagnosed this patient as suffering from goitrogenous asthma if I had not seen a somewhat similar case fifteen years previously. A woman twenty-eight years of age was sent to my out-patient department on account of persistent asthma. I found that I could just feel a nodular goitre in the supra-sternal notch when the patient swallowed. There was no evidence of enlargement of the cervical portion of the thyroid gland. X-ray examination showed a retrosternal enlargement of the thyroid with pressure on the trachea.

The history of this case of asthma developing after thiouracil treatment of thyrotoxicosis, in a woman who had never suffered from asthma before, at once suggested that a nodular goitre had increased

in size owing to the thiouracil, and was now pressing on the trachea, causing reflex bronchial spasm and asthma. And such proved to be the case. The house physician was very sceptical, as he had never met with such a case before and did not believe in its existence. Further, his clinical examination was faulty and he did not recognize the goitre to be nodular in character. The surgeon also was dogmatic in his opinion that the thyroid had nothing to do with the asthma.

I had the satisfaction of seeing the patient restored to health, freed from the continuous menace of crippling attacks of asthma, and, instead of being a perpetual invalid, able once more to resume her work.

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THE PREMENSTRUAL TENSION SYNDROME

“The condition of the female sex has been frequently the subject of compassion to medical writers, because their constitution of body is such, that every state of life brings its peculiar diseases.”

THE RAMBLER

A SINGLE woman, twenty-seven years of age, consulted me early in 1954 on account of periodical swelling of the face, breasts, thighs and upper arms, often accompanied by a rise of temperature to about 100° F. During the attacks she felt tired mentally and physically, and was very sleepy. The swollen areas of the body, especially the breasts, were painful and tender, and during the attacks very little urine was passed. The first time the swelling was noticed was about three years previously, following what was described as an attack of glandular fever. The monthly periods began at the age of thirteen, there was then no period for a year. The second period was also followed by a year without one, and subsequently the periods had been very irregular and scanty. The patient noticed that during the times of the swelling she put on several pounds in weight, sometimes as much as a stone, and as the swelling went down the weight also fell to normal.

Miss J., when well, was an attractive but somewhat pensive young lady, engaged in the entertainment world. The recurrent attacks, however, had been so severe and so disabling as to interfere with her work, which she had eventually been compelled to give up, and she was now living at home, perhaps feeling herself a burden on her relations.

The general practitioner had referred the patient to an endocrinologist at a hospital three years before she came to me. She was not swollen at the time of the examination, the blood count was normal, and the condition was considered to be functional.

Her practitioner examined her again later, during an attack, and found that during a period of three days, the bust measurement increased an inch and a half, and the waist and thigh measurements also became greater. During two attacks the temperature was found to be raised to just under 100° F., and the patient said it had been considerably higher at other times. The basal metabolic rate had been estimated four months before I saw her, and was +4 per cent. The skin was very dry, and so the patient was given thyroid extract gr. $\frac{3}{4}$ twice daily by mouth, which improved the growth of her hair.

Her doctor wrote to me saying he felt most unhappy about labelling

the whole thing as functional and asked if I could throw some light on this rather odd story.

When I examined Miss J. early in March she said it was one of her good days. There was no swelling, the blood pressure was 120/80 mm. Hg. and I could find nothing abnormal. The patient's height was 5ft. 3 in., and weight (clothed) 9 st. 5 lbs. This was her normal weight, but she told me that during one attack her weight increased over a stone. The evidence pointed to periodical water retention, due possibly to a pituitary-ovarian disturbance, and I arranged for admission to hospital for investigation. Miss J. was admitted on March 5th when there was still no swelling. Our tests were carried out, and the patient then conveniently had a typical attack of swelling, on March 10th, which lasted for five or six days. The results of the investigations were as follows:—

X-ray of skull: The pituitary fossa is small and there is calcification and bone formation in the inter-clinoid ligaments, resulting in bridging of the sella. This was not considered by the radiologist to be of any significance. *X-ray of sinuses:* Normal. *X-ray of teeth:* No apical infection seen. *Blood count:* Red cells 4·5 millions per c.mm., Hb. 92 per cent, C.I. 1·02, White cells 9,800 per c.mm., polymorphs. 78 per cent, lymphocytes 15 per cent, monocytes 6 per cent, eosinophils 1 per cent. Sedimentation rate 5 mm. per cent plasma at one hour (Wintrobe). *Serum:* Potassium 5·0 mEq/L, sodium 146 mEq/L, calcium 9·4 mg./100 c.c.—all normal. No agglutination with a suspension of *Br. abortus* at a dilution of 1 in 20, or over. *Urea clearance test:* Renal function 98 per cent. *Blood urea:* 26 mg./100 c.c. *Urine:* No albumin, no casts in deposit. *17-ketosteroids:* 22·6 mg. per twenty-four hours. The normal reading for a woman is 5 to 15 mg. per twenty-four hours, but it is usually thought that unless the reading is more than double the normal maximum, i.e. over 30 mg., it should not be considered as abnormal.

The fluid intake and output were balanced at about 68 oz. in the twenty-four hours, during the first few days in hospital, but two days before the first symptoms of the attack, the urine output fell to 24 oz. in the twenty-four hours, with no diminution in the fluid intake.

Miss J. first noticed swelling of the left breast on March 10th, the next period being due on March 13th. There was tenderness in the upper and outer quadrant of the left breast. There was also a return of what were perhaps the most distressing symptoms, lassitude, sleepiness and inability to concentrate. The next day both breasts were swollen, the bust measurement increasing 3 in. There was also an increase in circumference of 1 in. in each thigh and the arms felt heavy on brushing the hair. The fluid retention continued until the period began on March 15th, when the swelling of the tissues rapidly dis-

appeared, and the patient became less sleepy and more cheerful. There was no rise of temperature during the attack. The period was scanty, only lasting two days. Miss J. left hospital on March 18th, and the following treatment was advised. No salt to be added to the food at table, and very little to be used in cooking. Foods rich in salt to be avoided, i.e. toast, Ryvita, Vitaweat, butter, cheese, bacon, ham, smoked haddock, tinned salmon, kippers, sardines and pickles. Neo-Selarom to be used as a salt substitute, if desired. Æthinyl-œstradiol mg. 0.05 tablet to be taken daily for three weeks after the cessation of each period. Æthisterone, mg. 10 tablet to be taken three times a day daily from the 14th to the 24th day of the menstrual cycle. The patient also continued to take thyroid extract, gr. $\frac{1}{2}$ twice daily.

A month later the doctor told me that Miss J. was troubled with nausea, and so the æthinyl-œstradiol dosage was reduced, 0.05 mg. tablet being taken daily from the 7th to the 20th day of the menstrual cycle, reckoning from the first day of the period.

Two months later I was asked to see Miss J. again. Both she and her doctor were very pleased with the result of the treatment. The periods had recurred regularly at intervals of three and a half weeks, each lasting three days, with an increase in the total blood flow. There had been no recurrence of the attacks of swelling, lassitude and sleepiness. The patient said "I feel remarkably well. I am my normal weight. I am not at all tired, and I am now working again."

Comment. The premenstrual tension syndrome must not be confused with the varying degrees of pain and discomfort which often precede menstruation. Frank (1) in America, as long ago as 1931, described what he called "The Hormonal Causes of Premenstrual Tension." The first case presented with premenstrual epileptiform convulsions, and the second with premenstrual asthma. In another case premenstrual œdema was noted in the face, hands and feet. By examination of the blood and urine Frank concluded that the condition was due to an excess of the "female sex hormone" in the blood. In severe cases he recommended the application of a sterilizing dose of X-rays to the ovaries. Thus in the case of premenstrual asthma "a sterilizing dose of röntgen ray was directed against the ovaries. For two and one-half years complete amenorrhœa existed and with it complete freedom from asthmatic attacks." The patient then had a severe asthmatic attack followed a few days later by a normal period.

It is probable that the symptoms of this syndrome are due largely to water retention associated with sodium retention in the tissues. Both œstradiol and progesterone are said to cause water retention, but in varying degrees, œstradiol being more powerful in this respect. Progesterone is considered to be antagonistic to œstrogens, and also

to be diuretic. Greene and Dalton (2) relate the syndrome to an abnormally high œstradiol/progesterone ratio. They postulate that water retention may occur with a fairly low level of œstradiol if progesterone is entirely lacking, or be absent with a very high level of œstradiol if progesterone is present in adequate amounts. They obtained satisfactory results in over 50 per cent of their cases by the administration of progesterone by mouth. This can be given in doses of 30 to 150 mg. daily for twelve days from the 14th day of the cycle. In over 80 per cent of cases intramuscular injections of progesterone afforded complete relief.

Other observers consider that a lack of œstrogen, rather than an excess, may be a causative factor in some cases. Thus Rubenstein (3) found that severe and incapacitating premenstrual headache occurring in young women could be relieved at once by an intramuscular injection of 1 mg. of œstradiol dipropionate. Examination of vaginal smears indicated a low hormone level, despite the maintenance of menstrual function. In the case of ovarian asthma which I have described (see p. 57), the condition was cured by injections of œstradiol and progesterone, which suggests an ovarian deficiency.

Mustakallio and Kinnunen (4) obtained good results in one case of the premenstrual syndrome, which failed to respond to treatment with progesterone, by the administration of Katonium, a sulphonic cation exchange resin. The cation exchange resin takes up ions bearing a positive charge, such as potassium, sodium, calcium, magnesium, ammonium and hydrogen. Katonium is therefore used to remove sodium. The patient was given Katonium 15 G. three times daily by mouth for two weeks with a low sodium diet. Severe renal damage is a contraindication.

The most characteristic feature of the syndrome, in my experience, is the water retention, and it is possible that cerebral œdema is the cause of the mental symptoms. The condition might therefore be called the "Premenstrual Hydræmic Syndrome."

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PYÆMIA

“ Pus, the thicker and whiter it is, the less is the danger.”

CELSUS

ON the evening of November 13th I was called to see a man, fifty-one years of age, suffering from severe diarrhœa with fever.

On enquiry into the history of the illness I was told that on November 1st the patient had dined at a restaurant in the West End of London, where he had eaten some fish, but no oysters. Ten days later, while returning from his work as a tailor, at 4.30 p.m., he was suddenly taken ill with shivering, and a pain low down in the back and in the region of the bladder. On reaching home he went to bed, and put hot bottles to his back and feet. He then complained of frequency of micturition, with pain. The pain was of a burning nature situated in the region of the bladder, and it was also felt at the tip of the penis on passing water.

There was nothing of significance in his earlier medical history. Twenty-seven years previously an operation had been performed for acute appendicitis, and fourteen years ago he had been operated on for strangulated hernia. There had been no previous urinary trouble.

On November 11th his general practitioner visited him, and found the temperature raised to 102.4° F. and the pulse to 110. The urine contained a trace of albumin. In view of the persistence of the frequency a diagnosis was made of acute urinary infection, probably cystitis, and Sulphathiazole was prescribed, 1 G. every four hours by mouth, together with a potassium citrate mixture.

The frequency and painful micturition ceased in thirty-six hours, but the temperature remained raised to about 102° F., and now a fresh symptom, diarrhœa, began.

When I was called in, on the 13th, the diarrhœa was subsiding, but the temperature was still 102° F., and the pulse rate 110. The motions had been profuse and watery, with no blood or slime, and had recurred about every two hours, by day and by night.

I found the patient's general condition good. His complexion was ruddy, he was mentally alert, the skin was dry, and the only abnormal sign I found was that the tongue had a thick white fur, the tip and edges being clean.

On further questioning I was told that the patient had vomited twice the day before I had seen him, and he had noticed a vague headache for a day or so, which had now disappeared.

The only diagnosis I could make was cystitis, with perhaps food

poisoning, causing colitis. I realized that this was a very unsatisfactory diagnosis and was probably incorrect as it implied that the patient was suffering from two diseases, quite unconnected and showing themselves within a few days of each other. Against the diagnosis of food poisoning was the fact that the patient had taken all his meals at home, apart from the one dinner at the restaurant, and no one else who had shared the meals had been similarly affected. I advised that the sulphonamide drug should be discontinued, and that, if there was no improvement the next day, he should be admitted to hospital for investigation.

I heard no more for two days, and then I was told that the temperature was still 101° F., and, although the diarrhœa had nearly ceased, the patient appeared more ill, and considerably weaker.

I was not able to arrange for his admission to hospital until the morning of November 17th, two days later. An examination was now made by my house physician, who reported that the patient looked very tired and weak, but no abnormal signs could be found. The blood pressure was 110/65 mm. Hg. The diarrhœa had ceased, the temperature was normal on admission, but rose to 101° F. in the evening, and the pulse was still 110. The urine was clear, but contained a trace of albumin. A rectal and proctoscopic examination were made, and nothing abnormal was found beyond a few piles. No enlargement or tenderness of the prostate was found either by the house physician or registrar. During November 17th the amount of urine passed was 45 oz. On November 18th the urine output was recorded as 4 oz. in the twenty-four hours, but the patient went out to the lavatory, and probably more urine was passed. The temperature was 98° F. in the morning, and 101·2° F. in the evening. I saw the patient in the afternoon, when he did not appear to be seriously ill, and had no complaints.

On November 19th the urine output was recorded as only 2 oz. in the twenty-four hours, but the patient had again been out to the lavatory. The temperature was 100° F. in the morning and 99·8° F. in the evening. Some coarse râles were now heard at the base of the left lung.

The condition was much the same on November 20th, but the urine output was only 3 oz., and on catheterization 24 oz. of urine were removed. On November 21st the patient was very much worse, he was collapsed, cyanosed and the respiration rate was raised to 50 a minute. The blood pressure had fallen to 95/60 mm. Hg. and there was evidence of shock. A genito-urinary surgeon was now called in and he found the left lobe of the prostate enlarged, with two soft circular areas about 1 cm. in diameter at the lower pole, and a firm area above. The right lobe was flat. A diagnosis of uræmia due to prostatic obstruction was made, and the surgeon said that there was

a possibility of carcinoma of the prostate. An indwelling catheter was passed, and during the next twenty-four hours 51 oz. of urine drained away.

An intravenous drip transfusion of one pint of normal sodium bicarbonate solution was given slowly. Penicillin intramuscular injections were also now commenced. In the evening the patient was mentally confused, and sweating freely. The blood pressure had risen to 105/65 mm. Hg. At 10.30 p.m. the patient's general appearance was much improved, the breathing was slower, and one pint of Ringer-lactate solution was run in by drip transfusion during the next eight hours.

On November 22nd the blood pressure was 100/60 mm. Hg., pulse 120, respiration 40, and temperature 97° F. in the morning. Coarse crepitations were now heard over both lungs from base to apex. During the day 41 oz. of urine drained through the catheter and the patient had improved somewhat, the shock symptoms having disappeared. He looked, however, desperately ill, his face was thin and pinched, whereas a few days before it was rotund. At 6 p.m. the lungs were still more bubbly and there was some faecal incontinence.

On the afternoon of November 22nd I discussed the case with a class of post-graduate students, describing the clinical course of the illness, and the results of the investigations available. I was not aware that the genito-urinary surgeon had suggested the possibility of carcinoma of the prostate, but understood he had found an enlarged prostate which he considered was causing obstruction.

The very sudden onset of the illness, with bladder symptoms, pointed to cystitis. The diarrhoea was difficult to explain, unless it was due to food poisoning, and I pointed out the fallibility of assuming a double etiology to an acute illness. We had not the results of the blood culture, nor of the agglutination tests for the typhoid group. The X-ray film of the chest showed a trace of fluid at the left base, and a few small, soft shadows in both lung fields. A suggestion was made that these were due to acute tuberculosis or to diffuse bronchopneumonia. The blood count on admission showed Hb. 100 per cent, White cells 31,700 per c.mm., polymorphs. 94 per cent, lymphocytes 2 per cent, mononuclears 4 per cent. The sedimentation rate was 20 mm. plasma per cent (Wintrobe). The blood urea was very high, 255 mg./100 c.c. There was acidosis, as shown by the alkali reserve of 25.4 c.c. CO₂ per cent, and the blood chlorides were low, 298 mg./100 c.c. Microscopical examination of the urine showed numerous coarse granular casts, with scanty pus cells, and a moderate growth of staphylococcus aureus.

After some discussion we considered that the illness had begun as an acute infection in the bladder, that the changes seen radiologically

in the lungs were probably congestive, possibly due to an early broncho-pneumonic condition, and that the uræmia was more likely to be due to a renal condition than to the prostatic obstruction. The points in favour of this were the presence of the granular casts, and the high blood urea before there was retention of urine. Further, a second blood urea report had now come in, the blood being taken after the prostatic obstruction had been relieved by catheterization, and this showed a rise to 446 mg./100 c.c.

Sufficient attention was not paid to the high white cell count, which must surely have suggested an acute inflammatory lesion, and the diarrhœa remained unexplained, unless it were a uræmic manifestation.

During the night of November 22nd the patient became weak and drowsy, and gradually passed into coma, and death occurred at 2.30 a.m. on November 23rd.

A post-mortem examination was made. The prostate was much enlarged to form a mass 6 in. in diameter surrounding the urethra. On section, fibrous septa were seen, with loculi of pus representing a long-standing prostatic abscess. The heart was of normal size, with several abscesses present in the muscle of both ventricles. Multiple septic infarcts were present in the lungs, some of which were breaking down to form small abscesses. A small abscess was found in the right sternomastoid muscle. The large intestine was distended with gas, but the walls of the intestine were normal. The spleen was enlarged and soft, weighing 10 oz., and three septic infarcts were present. The liver was fatty and contained multiple small abscesses. The cortex of the kidneys was pale, and multiple abscesses were present. There was no hydronephrosis. The brain was œdematous, but contained no abscesses. Swabs from the abscesses showed a profuse growth of *staphylococcus aureus*.

Death was considered to be due to renal failure associated with prostatic abscesses and pyæmia.

Comment. I have only seen one case of prostatic abscess before, and that was many years ago when I was a house physician. The patient was admitted as a case of P.U.O., and no cause was found for the continued temperature, until the autopsy was made a few days later. The difficulty of diagnosis of prostatic abscess, even when the examination is made by an expert, is illustrated by this case. From the post-mortem findings it appears probable that the prostate was so large that on rectal examination, the examining finger did not reach to its upper border. Further, it is also probable that the gland was bulging into the bladder, rather than into the rectum, so that the enlargement was not detected when the patient was admitted to hospital.

It is difficult to account for the diarrhœa. Various suggestions were made. Could it have been a toxic reaction to the Sulphathiazole? This appears unlikely, for the amount of drug taken was small, and the patient did not seem to be upset by it. Was the diarrhœa uræmic in nature? If so this implies that as the uræmia got worse the diarrhœa got better, which is difficult to accept. Further there was no evidence of uræmic colitis found at autopsy. Was the diarrhœa toxæmic, due to the septicæmia and pyæmia? Here again there is the same objection, why should the diarrhœa cease, as the pyæmia became more intense. One other suggestion was made, that the diarrhœa was a reflex process, resulting from rectal irritation of the prostatic abscess. This seems very unlikely. It is also interesting to note that the patient had, according to the post-mortem report, a long-standing prostatic abscess without any symptoms until he was suddenly struck down, as by a bolt from the blue, when the pyogenic organisms entered the blood stream.

A DIAGNOSIS IN THE MAKING

“If men will intend to observe, they will find much worthy to observe.”

THE ADVANCEMENT OF LEARNING

IN October 1954 I was asked to see a single lady, sixty-eight years of age, whose chief symptoms, according to the doctor's letter, were loss of appetite, exhaustion and palpitations.

The general practitioner wrote. “This patient was quite well and very energetic until about August 3rd last. Although retired, she works voluntarily for the blind since many years. She was on holiday in Devon when she woke up one morning with a violent headache and loss of appetite. After two days her ankles began to swell. This lasted about a week. Since then she has never felt well, food is repulsive to her, and she has lost much weight. Her weight was about 8 st. 5 lb. It is now 6 st. 13 lb. I have had a number of investigations carried out and for your information I enclose some letters, etc. From these you will see that in 1953 she had eye trouble which cleared up, thought to be caused by sepsis from possibly an antrum. This was not established, however. Both Miss M. and I feel that full investigation is very necessary, preferably in hospital. She feels so very ill that she fears she cannot carry on any longer.”

The patient consulted me on October 19th, 1954, and I first looked through the various reports from an ophthalmologist, and then proceeded to go more fully into the medical history.

Some authorities state that an accurate diagnosis can be made in over 80 per cent of cases by a careful history. In June 1953 Miss M. noticed double vision while reading an evening paper, and next morning, on looking in the glass, she saw the right lower eyelid was swollen, as if it had been bitten by an insect. She was in London at the time and did not consult a doctor. She then went to Yorkshire and the diplopia continued. On returning to London she consulted her doctor and was referred to an eye specialist in the middle of July. He said that the right eye was prominent, which the patient had not noticed, but the swelling of the lower lid had now disappeared. The diplopia persisted and the eye remained slightly prominent; at the end of September Miss M. consulted another ophthalmologist who admitted her to hospital for a week for investigation. The diplopia disappeared after being in hospital for four days and recurred three weeks later. She again attended hospital as an out-patient and within another three weeks the diplopia disappeared and has not returned. The investigations in hospital were not helpful, and it was concluded that the

proptosis was due to cellulitis of the retro-orbital tissues, possibly secondary to an infection, although the ophthalmologist said that he could not be certain what was the cause of her trouble. The investigations included X-ray examination of the skull and of the sinuses, examination by an ear, nose and throat specialist, X-ray examination of the teeth, and a blood Wassermann test. None of these tests revealed any abnormality. Miss M. continued to attend the eye outpatient department until she saw me in October 1954, although the diplopia and the swelling of the lower lid had not recurred. She did this because the eye specialist said there was still a very slight prominence of the right eye. It was so slight that she was not aware of it herself. During February and March 1954 she took a mixture containing potassium iodide.

In February 1954 Miss M. woke with a severe bilateral frontal and temporal headache and bilious vomiting, which continued for thirty-six hours. It was very similar to the sick headaches she had suffered from for the past thirty years. This was followed by pain in the right supraspinatus region, and an X-ray examination of the cervical spine showed signs of arthritis. In April 1954 Miss M. developed tenosynovitis of the right extensor carpi ulnaris muscle tendon, and this was treated by an orthopaedic surgeon by incision of the tendon sheath, with relief of the pain.

The headache early in August 1954, referred to in the doctor's letter, was situated on the right side in the frontal region. After taking two aspirin tablets and a cup of tea the headache was relieved, but it recurred the next morning and again responded to the same treatment. During the holiday in Devon she had taken goat's milk in her morning tea, which was intensely repulsive to her, and she wondered whether this caused some infection. There was now complete loss of appetite. This was a new symptom which began directly after the headache disappeared and continued up to the time of seeing me. Two days after the headache both feet and legs swelled, the left rather more than the right, and the swelling persisted for nine days. There was no pain in the legs. A friend first called her attention to the swelling of the legs as she was sitting with her feet up on a stool. The swelling extended about half way up each calf, and it pitted on pressure. During this acute attack Miss M. lost a stone in weight in ten days, and there was marked tremor of the hands.

On returning from her holiday in August 1954, Miss M. complained of pain in the chest below the left clavicle, in the left shoulder region and down the left arm, and she was referred to a cardiologist on the assumption that the pain might be cardiac in origin. Nothing abnormal, however, was found in the cardio-vascular system, beyond a blood pressure of 165/80 mm. Hg., and a little thickening of the brachial arteries.

The blood count on August 30th, 1954, was Red cells 4·4 millions per c.mm., Hb. 78 per cent, C.I. 0·9, White cells 5,400 per c.mm., polymorphs. 68 per cent, lymphocytes 30 per cent, eosinophils 2 per cent. The sedimentation rate of the red cells was raised to 25 mm./1 hour (Westergren).

I was not able to obtain all the details of this complicated story at my first attempt. The patient naturally overlooked certain points and I overlooked others, and it was only after thinking over the story and questioning the patient on doubtful points at my visits to her during her first week in hospital that I was able to clear up the uncertainties and compile the detailed history as I have presented it here. In any clinical examination of a difficult case it is necessary to return to the examination on several occasions to see if one can find any point which has been overlooked and to enlighten obscurities in the history.

Miss M. said as I began to examine her, "I feel very, very, very ill indeed. I cannot eat anything. The sight of food just makes me feel faint. I have lost all this weight, ever since August I began." I found the fall in weight in the last two and a half months amounted to one and a half stones. Miss M. was 5 ft. 1 in. in height and weighed 6 st. 13 lb. (clothed). She told me that she had no pain, but rumbling in her stomach. For the last week the motions had been loose, but not diarrhœic, the bowels being opened twice in the twenty-four hours, in the morning and evening. Normally she passed a formed motion twice a day. She also complained of severe "nausea" of a week's duration, and felt very giddy and trembling. She said "I cannot stand, I just have to sit. I feel very weak as if I were going to pass out."

When I asked whether by "nausea" she meant that she felt she was going to be sick, she said that she did not feel that she wanted to vomit or to retch, but she had an uncomfortable full feeling under the lower part of the breast bone, and it was unaffected by taking food. On further questioning about abdominal pain, Miss M. said that on August 18th, 1954, she had a severe attack of pain all round the centre of the abdomen, which she thought was due to wind, lasting for about an hour and a half.

I now made my clinical examination. The patient looked ill, sallow and thin. I could only detect slight prominence of the right eye, there was no widening of the palpebral fissure, no diplopia, and the ocular movements were normal. There was no nystagmus. The tongue was clean, not smooth and not sore. I found no signs of disease of the central nervous system. Most of the teeth had been extracted, the lower central ones only remaining, and there was an upper and a partial lower denture. There was no enlargement of the thyroid gland, in fact the thyroid was difficult to feel although the neck was very thin, and there were no enlarged lymphatic glands. The heart and lungs

were normal. The brachial arteries were thickened, and the blood pressure 170/100 mm. Hg. The pulse rate was 96 a minute, regular. The urine contained no albumin and no sugar. The abdominal aorta was thickened and easily palpable, but beyond this I felt nothing abnormal in the flaccid abdomen and there was no visible peristalsis. Neck movements were a little restricted, and there was tenderness over the right supraspinatus muscle. The palms were moist and there were fine tremors of the fingers. There was no lid lag, and on looking upwards the forehead wrinkled normally. Screen examination of the chest showed no abnormality, beyond slight uncoiling of the aorta.

The marked and sudden loss of appetite, the loss of weight, general weakness and later "nausea," suggested the possibility of carcinoma of the stomach as the most probable diagnosis; the swelling of the legs perhaps could be explained by a venous thrombosis, which may be an early sign of cancer of the stomach. If this were the correct diagnosis, the unilateral exophthalmos would have been due to some other cause.

Miss M. was admitted to hospital on October 19th, the day she consulted me, and a barium meal examination was carried out the next day. This showed no abnormality beyond coloptosis. There was no hiatus hernia and no evidence of gastric carcinoma. What was next to be done? I ordered a fractional test meal and examination of the fæces for occult blood, also a blood count and estimation of the sedimentation rate of the red cells, to be followed by a determination of the basal metabolic rate.

At my next visit Miss M. asked me the result of the barium meal, and when I told her it was normal she appeared very relieved, saying she thought she must have a growth in the stomach.

October 22nd, 1954. As I walked along the corridor to see Miss M. to-day the house physician said, "Why did the X-ray show no signs of carcinoma when the stomach contents were full of blood?" This was the first news I had received of the fractional test meal. He then said that the resting juice was dark brown, as if it contained altered blood, and there was a little bright blood in it. The next two specimens were dark brown, the later ones were clear.

I examined the patient again. She felt rather better and had eaten a little more, although not caring whether she ate or not. The blood count was very similar to the previous one, the red cells numbering 4.2 millions per c.mm., and Hb. 75 per cent. The sedimentation rate of the red cells was lower than at the last examination on August 30th. It was now 15 mm. one hour (Westergen).

How can we explain the absence of severe anæmia if there was much blood in the stomach contents? Why did the early specimens only show blood? Did the bleeding come from œsophageal varices?

The mystery grows. What will the analysis of the fractional test meal show? On palpating the abdomen I now felt the tip of the spleen, just touching the fingers with each inspiration. It was not tender, but smooth with rather a thick rounded lower border. Did I fail to detect this at my first examination? I could not feel the liver. To-day Miss M. has pain in the sacral region which she tells me she has suffered from before.

October 23rd, 1954. Miss M. is not feeling so well to-day. An enema was given last night to get rid of the barium and this was followed by severe griping pains. There was no blood seen in the enema result. Miss M. says, "I am not at all good. I could be sick at any moment." There had been, however, no vomiting and Miss M. had taken three pieces of toast with butter, and tea for breakfast.

The alcohol fractional test meal report was now available. The fasting specimen and the next two specimens contained blood. The odour was normal. The early specimens contained free acid, the later specimens contained no free acid. The total acidity was not unduly high. There was therefore no diagnostic evidence of carcinoma of the stomach, although the absence of achlorhydria does not exclude the possibility of cancer, as free hydrochloric acid may be present in the stomach contents in 30 per cent of cases of gastric carcinoma.

I examine the patient's legs again. The left plantar response now appears extensor, the right is definitely flexor. The knee-jerks are brisk. There is no dysdiadokokinesis and no nystagmus. I wonder whether there may be a cerebellar tumour causing the "nausea," the giddiness and unsteadiness. We are now awaiting the result of the occult blood test on the faeces, and the basal metabolic rate. The blood urea is also being determined to exclude the possibility of uræmia, which is very unlikely as the urine contains no albumin.

October 12th, 1954. I visited Miss M. at 5.30 p.m. to-day. She had felt very weak and exhausted in the morning until about half past eleven, after that she felt better. She certainly was eating better. For lunch she had taken chicken, creamed potatoes, spinach and fruit salad. She does not want food but she takes it. The "nausea" only occurs after eating, but "all day," she says, "I feel—oh, I do not like my inside." There was a little low backache again yesterday. I tell her I think she is looking a little better, to which she replies, "That is the rest in bed." The temperature has been consistently 97° F. morning and evening, but Miss M. says she feels so hot, as if she were "on fire." Has she hyperthyroidism? I can feel the spleen very easily to-day, I think I can feel the notch on deep inspiration. The left plantar response again appears to be extensor. What will the B.M.R. result be? One determination has been made to-day, and a second one is booked for to-morrow. As I leave, Miss M. says,

“ Will you be able to find out what is the matter with me? ” to which I reply, “ We shall be poor doctors if we cannot.”

October 27th, 1954. My house physician rang me up and said the blood urea was normal, 38 mg./100 c.c., but the basal metabolic rate was raised, the result on the second day of the test being plus 22 per cent. The first test suggested the possibility of an anxiety state. The next stage is now clear; the patient must be given iodine for two weeks and then the B.M.R. repeated. If it has fallen noticeably it would strongly tend to confirm the diagnosis of thyrotoxicosis. Thyrotoxicosis would explain the monocular proptosis, the lassitude, loss of weight, sweating, looseness of bowels and feeling of heat. Anorexia does also occur in thyrotoxicosis in a minority of patients, in these cases the loss of weight is more noticeable. A voracious appetite with loss of weight is known as the von Müller paradox. Further, the spleen, according to Means (1), can be palpated in a few cases of toxic goitre, and I remember in 1939 a patient was in hospital under my care with severe thyrotoxicosis in whom the tip of the spleen was palpable. Swelling of the ankles, according to McEwan (2), may occur early in cases of hyperthyroidism. This he says may be due to “ loss of tone.”

A diagnosis of thyrotoxicosis, however, would not explain the presence of blood in the early test meal specimens, so I am arranging to have the fasting gastric contents withdrawn again. Neither would it explain the ? extensor left plantar response.

I visited the patient at 5.15 p.m. She said, “ This is my best day. It is the first morning I have not felt exhausted. The “ nausea ” has not gone—it is a peculiar feeling, not real nausea, I am just not comfortable all the time. For the last two nights I have had heartburn after my evening meal; this is something new.”

I find that Miss M. has eaten well, and taken toast, tea, butter, grapefruit, mutton, boiled celery, baked potato and prune purée. She has had the first dose of the iodine, 10 drops of Lugol's solution, which contains the equivalent of mg. 60 iodine in each dose. She is to take this t.i.d. for two weeks. She looks better, less tired. The temperature is still 97° F. The occult blood test on the faeces is negative. This is opposed to the presence of a constant source of bleeding in the stomach. I wonder if the bleeding was traumatic, if so why did there appear to be altered as well as fresh blood in the resting juice? Is fresh blood rapidly changed in colour by the action of the gastric juice?

October 30th, 1954. I visited Miss M. at 11 a.m. She said, “ I am better than when I came in but I am still very cheap.” The house physician had withdrawn the fasting stomach contents this morning, which amounted to 30 c.c. The fluid was white, clear and contained

one fleck of bright blood. I think the blood in the previous specimens must have been due to trauma from the fractional test meal tube. The laboratory report on the faeces had now been received. It read as follows: "No pus, blood, ova, cysts or parasites seen. No undigested muscle fibres. No pathogens isolated."

The temperature rose to 98° F. on the evening of October 28th, the iodine having been commenced on October 27th. The spleen is less easily felt to-day, the left plantar response still appears extensor. The pulse is 108, regular, and the palms are moist.

Miss M. says she has very little "nausea" now and very little heartburn, but after a meal the food still seems to be "there,"—pointing to the epigastrium—although food is no longer repulsive. She also complains of a dull backache in the lumbo-sacral region, so I asked for an X-ray of this area to see if there is any evidence of osteoporosis.

Miss M. still looks ill, thin, pale and slightly sallow and I am doubtful of the diagnosis of hyperthyroidism.

November 1st, 1954. I made my visit at 5.30 p.m. to-day. As I walked along the corridor Sister said "She is much better to-day." "Why is that?" I asked. "I do not know, perhaps it is the iodine," Sister answered. I asked Miss M., "How are you to-day?" "I really feel now I am on the mend," she replied, "I do not feel weak and my heart is not thumping as it was. My appetite is coming back and I have no longer any full feeling in my stomach. The 'nausea' has gone. I still have some pain in the back low down."

The patient looks very much better this evening. The pulse is 70 a minute. The temperature is again low, 97.2° F. The palms are much less moist. The left plantar reflex is now a doubtful flexor. The X-ray films of the lower spine and pelvis show osteoporosis of the bones. This would fit in with a diagnosis of thyrotoxicosis. I feel much more happy about the diagnosis this evening.

November 3rd, 1954. I visited Miss M. to-day after tea. She is still improving and says she feels much stronger and the "funny feeling" in the stomach has practically gone. The pulse is 70 a minute, regular. The temperature is now between 96° and 97° F. The repeat B.M.R. is to be done on November 10th.

November 6th, 1954. This morning Miss M. says, "I am feeling very much better. I have not that exhaustion. I am better in the morning on getting up. My appetite is better. I can now even choose my meals from the menu. I am not a burden to myself any more."

I find that there has been a gain of 2 lb. in weight during the last seven days, but Miss M.'s palms are again very moist and I feel doubtful about the diagnosis of hyperthyroidism. The patient certainly looks,

and is, very much better than on admission to hospital. Is it the rest or is it the iodine?

November 13th, 1954. When I visited Miss M. this morning she was looking much better, and she greeted me with "I feel perfectly well now. My appetite is quite normal. I should like to dress and go out." I was much relieved to find the basal metabolic rate had fallen to +5 per cent after the two weeks' iodine treatment. The weight had increased by another pound during the last week. The tip of the spleen could only just be felt on deep inspiration. The temperature was now usually about 98° F. and the pulse rate 70 to 80 a minute. The diagnosis of masked hyperthyroidism appears confirmed. What shall I do now? I would like the patient to have a small dose of radio-iodine by mouth, such as 5 millicuries, rather than continue with the Lugol's solution which may soon lose its effect.

November 15th, 1954. This evening I called a radio-therapist in consultation; he agreed with the diagnosis and said he considered a therapeutic dose of radio-iodine, 5 millicuries, was the most suitable form of treatment. The Lugol's solution is to be discontinued this evening and the patient will go to a single room in the radio-therapy department for the radio-iodine to be administered. She will probably excrete the non-fixed portion of the dose in the urine in five days.

November 17th, 1954. The patient says she feels perfectly well. She looks very well. She has had no iodine since the evening of November 15th and the X-rays show no evidence of retrosternal goitre.

November 23rd, 1954. I saw Miss M. for the last time in hospital as she is leaving to-morrow. She was given 5 millicuries of radio-iodine on November 19th. She told me that her backache had gone, her appetite is fully restored, she no longer has any morning weakness, there is no abdominal discomfort, and she feels "fine."

When I saw Miss M. in December, 1954, she felt much better but complained of bumping of the heart and of feeling nervous. I ordered her Lugol's iodine solution, 10 drops t.i.d. A month later she reported that the palpitations had ceased, she felt very well, and had gained 3½ lb. in weight. On April 5th, 1955, Miss M. weighed 8 st. 2 lb. (clothed), a gain of 17 lb. since I first saw her. She said "I am 100 per cent fit." I now advised her to reduce the iodine by a drop a day to zero.

In the case of thyrotoxic myopathy, described on p. 24, I also found it necessary to give iodine by mouth after the radio-iodine treatment in order to obtain the optimum effect.

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“ ARTHRITIS ” OF HIP

A YOUNG doctor, thirty-two years of age, consulted me in the autumn of 1948, desiring an opinion about his general condition. He told me that he was engaged in practice in Africa, and had come to England in April of this year to seek further advice about his right hip. For the last eight years not a day had passed on which he was free from pain. The trouble was first diagnosed as fibrositis, and later, after X-ray examination of the hip, as osteo-arthritis. For the last three years the pain had been much worse, and movement of the hip extremely limited. At the time that I first saw him the pain was so intolerable that the patient wished that he might end his existence, and was only prevented from so doing by a scruple of conscience. Walking was now restricted to about 60 yards, and this only with the aid of two sticks. No movement of the hip was possible without pain, and flexion was limited to 45°. For the last four months, since coming to England, he had spent practically all his time in bed. Three orthopædic surgeons had been consulted, all of whom diagnosed the condition as a low grade infective arthritis, which had progressed to the stage of considerable destruction of the joint surfaces, with cyst formation in the femoral head and roof of the acetabulum.

Two of the surgeons recommended arthrodesis, the third advised that no operation should be performed, that a caliper should be fitted, and that the patient should return to Africa wearing this appliance. At the time of consulting me he had decided upon this course of action. The caliper had been worn by day for ten weeks, with some relief of pain, estimated at about 10 per cent. The patient told me that for the last ten or fifteen years he had periodical attacks of fever lasting for one or two months about three times a year, and that during these attacks the sedimentation rate of the red cells rose to 50 or 60 mm. per cent plasma at one hour, with a high polymorphonuclear count.

Apart from the hip lesion I could find no sign of disease elsewhere. What advice should I give? The patient really wanted to return to his wife, family and practice in Africa, and thought he could manage to carry on with the use of a car. He was accustomed to visit about 60 patients a day, and did not have to go up and down stairs, as all the houses were of the bungalow type. There was no doubt about his pluck, but could he possibly continue to work with such a severe and painful disability?

I saw the X-ray films of the hip, and the cystic spaces suggested the possibility of xanthomatosis or of the localized variety of fibrocystic disease. Gout was also a possible, although a very unlikely alternative.

On enquiry, I found that no systematic investigations had been made. No X-ray examination had been carried out of the other bones, and no chemical tests on the blood. I had no doubt in advising the patient to cancel his return passage, for he was due to leave in two or three weeks, and come into hospital, so that we might endeavour to establish



FIG. 31. Right hip joint showing cyst-like areas in head of femur and acetabulum and narrowing of joint space.

the diagnosis. We should know then what was the best treatment to advise. This was agreed to, and further X-ray examination suggested that the lesion was not confined to the hip. The radiologist reported, "There are multiple cyst-like areas in the head of the right femur and also in the femoral neck and in the right acetabulum. These are associated with narrowing of the joint line due to cartilage absorption (see Fig. 31). Several other cysts are present in the middle of the shaft

of the right femur, and one or two of them appear to be eroding the cortex. There is a suggestion also of other cyst-like areas at an earlier stage in the upper and lower thirds of the right femur. The skull and other long bones show no X-ray evidence of abnormality and nothing abnormal is seen in the ribs. A tuberculous focus, probably old, is present in the upper zone of the right lung.” The radiologist expressed the opinion that the condition in the hip joint was not primarily an arthritis, and that it was similar to that present in the shaft of the femur. He suggested the possibility of xanthomatosis, myelomatosis and fibrocystic disease, and of these considered xanthomatosis as the most probable. Hæmorrhage into the bone marrow and hydatid disease were thought of, but considered to be very unlikely.

The blood chemical examinations showed the blood uric acid 3·4 mg./100 c.c., a high normal figure. The blood calcium and blood cholesterol were normal, 10·7 and 238 mg./100 c.c., respectively. In the localized variety of fibrocystic disease of bone the blood calcium is normal, but there were no other signs pointing to this condition. In bony xanthomatosis the blood cholesterol is not raised, and the diagnosis is best established by bone biopsy. There was no evidence of myelomatosis, the urine containing no Bence Jones protein; no myeloma cells were found in the bone marrow obtained by sternal puncture, and the alkaline and acid phosphatase contents of the blood were normal. The blood Wassermann reaction was negative, and the blood count and sedimentation rate were also normal.

The only possible way to establish the diagnosis appeared to be by bone biopsy, and with this in mind I asked a fourth orthopædic surgeon to see the patient. On looking at the X-ray films he expressed the view that the hip lesion was caused by a slowly progressive synovial type of tuberculosis which had subsequently invaded the bones, after destroying the cartilage, and he did not think that the cystic spaces in the femur had a similar pathological origin. The surgeon also noticed that the right inguinal glands were slightly enlarged, and a gland biopsy showed a caseating tuberculous lesion, despite a negative Mantoux test with a dilution of old tuberculin 1/10,000. This was considered to confirm the diagnosis of a tuberculous lesion of the hip. The bone biopsy from the shaft of the femur showed normal bone. The nature of the cystic spaces in the shaft of the femur remained unsolved.

The patient was now transferred to a special hospital for arthrodesis, which was to be followed by six months' treatment in plaster. It was hoped that this would result in relief of his pain and that he would then be able to return to Africa and continue there the practice of his profession.

I saw the patient again six months after the operation. An osteotomy had been performed between the greater and lesser femoral trochanters, and the femur fixed at the lower ischial margin of the acetabulum, with a 6×1 in. bone graft, taken from the tibia (see Fig. 32). Both legs were then in plaster. Two weeks later an acute Bact. coli cystitis developed, with hæmaturia, which was quickly cured by the administration of Mandecal.

The plaster was changed after eight weeks on account of trouble with the stitches, and fourteen weeks after the operation the patient began walking with crutches, wearing a hip plaster spica. When the plaster was completely removed five months after the operation the lymph glands in the right inguinal fossa suddenly enlarged, with a rise of temperature and increased sedimentation rate of the red cells.



FIG. 32. Right hip joint after osteotomy and fixation of femur to lower ischial margin of acetabulum by a bone graft.

The swollen glands subsided in about a month, with rest in bed and the application of hot bottles, and a plastic splint was then fitted.

When I saw the patient there was no movement in the hip joint, but the knee flexion was good. The hip was fixed in a position of slight flexion and abduction, and there was $\frac{1}{2}$ in. shortening of the leg. The muscles of the thigh were stiff on sitting, and the patient complained of severe pain in the thigh muscles on walking for the first few steps. He could walk in a room without sticks, and could go up and down stairs with the aid of two sticks. He was able to travel by tube or bus, and could walk out of doors for three hours continuously with the help of sticks. He was very happy about the result of the operation and said that every day he was feeling stronger.

Nine months after the operation he returned to Africa to resume his practice.

I heard from the patient periodically after his return to Africa. Three years later he wrote to say, “ I am keeping very good health, quite free from any pain. I have no trouble with the right hip and can walk well. I can bend my right knee completely, hence I can put on my stockings and also clip the nails of the right foot by myself. I heartily thank you again for enjoying good health after years of misery.” And so the physician once more is praised for the surgeon’s skill.

ILEAL STASIS

Doctor: Do you ever have pain, my dear?

Wife: Yes.

Doctor: Good! Do you ever have lower abdominal pain?

Wife (plaintively): You know I do. I have suffered from it for years.

Doctor: Ah, splendid! Now you can write an account of it.

And this is what she wrote: "I know chronic abdominal pain in many forms—perhaps the most usual is the spasmodic type situated largely in the lower abdomen and giving rise to a feeling of soreness all over, though there is no definite tenderness on pressure. It comes on usually for no known cause, but sometimes after a large stodgy meal, and lasts for two or three weeks, then subsides quite suddenly to be replaced after a short interval, by another variety of abdominal pain. There is a feeling of spasm and soreness, improved temporarily by lying down, and comforted, but not relieved, by heat. On standing some relief is obtained by relaxing the abdominal muscles and allowing the shoulders to come forward. The pain seldom prevents sleep, but is often there on waking and causes a desire to get up, largely for change of posture, and also for some distraction. The appetite is generally not very good when the pain is severe, but milk, Benger's food, etc., do definitely give some relief. The pain is usually worse after defæcation for some time, and also before an action of the bowels to a lesser degree.

"This chronic pain makes one feel tired easily and afraid to undertake heavy physical work, but, on the other hand, having little to do enables one to dwell on one's symptoms and so makes them seem worse. It has no effect on one's interest in food, but makes one rather 'choosey' in one's diet."

As doctors, we are frequently asked to see patients, particularly women, who suffer from chronic or recurrent abdominal pains, for which no cause has been discovered. Abdominal examination often reveals an appendicectomy and a cholecystectomy scar, but neither operation has afforded relief. On several occasions the sufferer has been admitted to a hospital or clinic where she has been subjected to barium meal, barium enema and fractional test meal examinations, without any significant abnormalities being found. Eventually the patient becomes resigned to live with her disability, which the doctor usually labels as functional.

* * * * *

A master builder, fifty-nine years of age, was in great distress because he had been unable to work for a year on account of abdominal pain. The pain, which began three years ago, was at first intermittent, but for the last few months was constantly present every day. It was situated in the lower abdomen in the centre and on each side, coming on shortly after getting out of bed in the morning. It continued throughout the day without intermission, but after being in bed for about an hour at night, it disappeared. The patient described the pain as feeling that there was "something in the way," accompanied by much distension in the lower part of the abdomen, and he passed much wind both by mouth and by the rectum. The appetite was poor, but there was no vomiting and seldom any nausea. There was no change in the habit of the bowels which were opened daily. During the last nine months the builder had felt totally exhausted and had lost eighteen pounds in weight.

I was asked to see Mr. A. at the end of April 1952, when he told me that he had taken many bottles of medicine without relief, and that a barium meal examination a month previously had shown no abnormality. I found a thin, sallow, poorly developed man, with a deeply furrowed face and an anxious expression. His somatotype was ectomorphic and, perhaps, he was unduly sensitive to pain. On lying down the abdomen was seen to be distended below the navel, and there was a little tenderness in the left iliac region, but nothing abnormal could be felt. When he stood up the abdominal contour suggested the presence of visceroptosis, the abdomen bulging below the umbilicus.

I arranged for a barium meal examination which showed a diverticulum arising from the first part of the duodenum, and several diverticula in the descending colon and sigmoid. In one of the films I noted that the terminal portion of the ileum was narrowed, with a "string-sign" appearance, such as is seen in Crohn's disease and certain other conditions. The small intestines were bunched together in the pelvis, and there was coloaptosis, but the radiologist did not refer in his report to these findings.

I advised that the patient should be given a low residue diet, a teaspoonful of liquid paraffin twice a day directly after meals, and ten minims of tincture of belladonna in an alkaline mixture three times daily before food.

Three months later I was asked to see the patient again as there was no improvement. He had lost another one and a half pounds in weight and still complained of lower abdominal pain, relieved by lying down. There was now considerable distension of the lower abdomen and peristaltic waves in the small intestine could be seen through the abdominal wall. It appeared there was partial ileal obstruction, and I made a provisional diagnosis of ileitis, and advised the patient to come into hospital.

The house physician noted visible peristalsis in the lower part of the abdomen, and on auscultation said there was "immense bowel activity." A direct X-ray examination of the abdomen showed fluid levels in the pelvis, probably in the small bowel, with an excess of gas in the small bowel. The barium meal was repeated, but it did not throw any further light on the cause of the abdominal pain. The radiologist reported, "No abnormality detected in the œsophagus or stomach. There is a diverticulum arising from the duodenum. No abnormality seen in the follow through examination up to six hours."

Here then was a case in which the clinical evidence pointed clearly to an abnormality in the last part of the small intestine, and yet, according to the radiologist's report, the barium meal revealed no abnormality. I asked my registrar to show the radiologist the one film of the previous barium meal which indicated a narrowing of the terminal ileum, suggesting a "string-sign." The radiologist expressed the opinion that it was of no significance, as it was not a constant defect. The barium enema showed no abnormality in the colon, apart from a few diverticula in the sigmoid. The blood count was normal. The sedimentation rate of the red cells was normal, 3 mm. per cent plasma/1 hr. (Westergren), which was opposed to the presence of an inflammatory, malignant or tuberculous lesion in the ileum. Fat digestion appeared normal, the total fat in dried fæces being 13·8 per cent, of which 10·6 per cent was split and 3·2 per cent unsplit fat. Microscopical examination of the fæces showed no abnormality. A pyelogram indicated that the renal pelves, ureters and bladder were normal in contour.

The investigations therefore gave us no positive help, but probably excluded a serious organic lesion such as intestinal carcinoma, tuberculosis or Crohn's disease. The ileal narrowing, being inconstant, was opposed to a diagnosis of Crohn's disease and favoured a condition of spasm. This appeared to be provoked by standing, probably due to the drag of the small intestines associated with the visceroptosis. On lying down this drag was relieved.

There are, I believe, some physicians who deny the occurrence of visceroptosis, or who maintain that visceroptosis, if present, gives rise to no symptoms, but I am not among their number. My experience is opposed to this view, and the relief which patients who suffer from symptoms of visceroptosis obtain by wearing a suitable lower abdominal support, appears additional evidence that crowding together of coils of small intestine in the pelvis can and does result in lower abdominal pain.

The bowels were regularly opened daily and there was neither constipation nor diarrhœa, yet the abdominal pain continued every day when the patient was up, and so I now asked a surgeon to see the

patient, and he advised an exploratory laparotomy "in order to elucidate the pathology."

The operation was performed at the end of August, the report being as follows: "The abdominal organs were either visualized or palpated. No abnormality was detected in the liver, spleen, kidneys, prostate or stomach. About 13 in. below the duodeno-jejunal flexure two small masses were found adherent to the jejunum, one of these was removed for section and was shown to be a myoma. There were two adhesions, one between the ileum and the sigmoid colon, the other between the terminal ileum and the cæcum; these were divided. Multiple diverticula were found in the colon." There was therefore some degree of ileal stasis resulting from the adhesions, but no cause was found for the adhesions.

The patient made a good recovery, put on weight and returned home free from pain. I think, however, the future is rather uncertain. I see no reason why the adhesions should not form again and cause a recurrence of the symptoms.

Comment. The clinical evidence of ileal stasis proved correct in this case, the X-ray evidence was misleading. The "string-sign" of Kantor (1) is the characteristic radiographic manifestation of regional ileitis or Crohn's disease. It has been described as "a thin irregular linear shadow, suggesting a cotton string in appearance, and extending more or less continuously from the region of the last visualized loop of ileum through the entire extent of the filling defect and ending at the ileo-cæcal valves." Regional ileitis or Crohn's disease is not the only condition in which the "string-sign" may be found on barium meal examination. It may also be met with in hyperplastic ileo-cæcal tuberculosis, carcinoid of the ileum, endometriosis of the ileum, enterogenous cysts around the ileum or in abdominal actinomycosis.

Regional ileitis as defined by Crohn (2) is "a nonspecific chronic recurrent granulomatous disease affecting mainly young adults and characterized by a necrotizing, ulcerating inflammatory process." There is usually a low grade fever, abdominal pain, mild diarrhœa, progressive loss of weight and secondary anæmia. Ileal fistulæ frequently form, passing from the ileum to the abdominal wall, or from the ileum to other loops of bowel or to other hollow viscera. Rectal suppurative lesions should always be looked for in suspected cases of Crohn's disease.

In 1952 Morton Gill and Falle (3) published a paper on functional disorders of the small intestine, in which they pointed out that ileal spasm associated with abdominal symptoms could be sufficiently prolonged and severe as to mimic organic disease. In their first case Crohn's disease was diagnosed, but no abnormality was found on laparotomy. All the seven cases described were in women and all had

disordered bowel function, either diarrhœa or constipation. In each case a laparotomy had been performed and nothing abnormal found.

In the case which I have described above the patient was a male and the laparotomy revealed the cause of the trouble.

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WANTED—A DIAGNOSIS

“ ‘All that’s the matter with me is the affliction called a multiplying eye, and that’s how it is I look double to you—I mean, you look double to me.’

“ ‘A multiplying eye is a very bad thing,’ said Mark Clark.”

FAR FROM THE MADDING CROWD

ONE morning, early in October 1951, my house physician spoke to me on the telephone, saying he would be glad if I could diagnose a case which had been admitted to my ward in a state of coma.

At my next visit to hospital Dr. A. told me that he had been called to the ward five days previously to see an unconscious patient. The man was forty years of age, an English-speaking officer in the army of a foreign nation, temporarily stationed in London. From the friends who accompanied him my house physician learned that they were travelling in an underground train when the patient suddenly felt that his head was turning, that he could not see things clearly, and that he had double vision. After being helped out of the train at the next station, he sat on a seat on the platform and rapidly became unconscious. He was then brought by ambulance to hospital.

The house physician’s report: “I found the patient was a well-built man, with a rather sallow complexion. His hair was dark and curly, his eyebrows bushy, his lips thick and prominent, with a small black moustache. He was unconscious, but responded by movements to painful stimuli. The breathing was stertorous, and the left side of the mouth flapped slightly with each respiration, suggesting the probability of a stroke. There was no neck rigidity. The pupils were dilated, the right being larger than the left, and neither reacted to light. There was a divergent squint, and on examining the fundi slight blurring of both discs was noted. The left arm and leg were flaccid and apparently paralysed. Both plantar responses were extensor.

“I thought the patient was suffering from a cerebral hæmorrhage, and in view of his age and the fact that he was in the army, it appeared probable that the stroke was not due to hypertension, but to the rupture of a berry aneurysm. The blood pressure was 110/80 mm. Hg.

“At 10 p.m. I attempted a lumbar puncture, but on inserting the needle through the skin the patient became violent, moving both arms and legs, and the attempt was abandoned. Both plantar responses, however, remained extensor. The right pupil now reacted to light,

but no response was obtained on the left side and there was a divergent strabismus of the left eye. An hour later the patient was nearly conscious; full consciousness being restored by midnight."

The next day he again complained of double vision, but had no headache. A neurological surgeon was now consulted.

A neurological surgeon's report: "The patient is very loquacious and euphoric. The right pupil is larger than the left, and the right pupil reacts very sluggishly. There is diplopia in all directions, with diminished upward movement of the eyes. There is left facial weakness of the central type, with mild left hemiparesis. The reflexes are more brisk on the left side than on the right. The right plantar response is flexor and the left extensor. This patient probably has a cerebral aneurysm which is on the anterior part of the circle of Willis. I think he should have a right carotid arteriogram in order to establish the diagnosis, as he may have a recurrence of bleeding and it may then be difficult to do. The Wassermann reaction should also be determined and a lumbar puncture done. I think the former will be found negative, and, in view of the absence of stiff neck I should be surprised if there is any blood in the cerebro-spinal fluid."

The investigations which the neurological surgeon asked for were now carried out. The blood Wassermann reaction was negative, the pressure of the cerebro-spinal fluid was normal, but the protein content was raised to 110 mg./100 c.c. The cerebro-spinal fluid was normal in other respects; the cell count was 1 lymphocyte/cu.mm., the Wassermann reaction was negative, the Lange curve normal, and the sugar and chloride figures were also normal. Finally the cerebral arteriogram showed no evidence of aneurysm or other abnormality.

The diagnosis of rupture of a cerebral aneurysm being now excluded the patient was examined the next day by a neurologist.

A neurologist's report: "At present the patient does not describe the head turning that is mentioned earlier, and it is important to check with his friend whether his head really turned, and, if so, in which direction. There is minor swelling of both discs. The right pupil is larger than the left, both react to light, but the right one not so briskly. There is weakness of upward and inward movement of the left eye, and of downward movement of the right eye, with diplopia in all directions. There is nystagmus, especially vertically. There is a mild left hemiparesis affecting face, arm and leg. The reflexes are a trace brisker on the left side. The right plantar response is flexor and the left extensor. There are no sensory changes.

"This patient has probably had a symptomatic epileptic attack with a residual Todd's palsy, which is now recovering. There is not enough evidence to establish the etiology, but there may have been an acute hydrocephalic episode, with transient tentorial coning. I

recommend an electro-encephalogram as an initial investigation.”

The electro-encephalogram was now carried out, but it showed no evidence of epilepsy. The tracing was, however, abnormal, inasmuch as the dominant symmetrical alpha rhythm at 9 c/sec. was disturbed in all areas by random 6 c/sec. waves. There was low voltage underlying fast activity at 24 c/sec. in the central areas.

During the next two days there was no appreciable change in the patient's condition. The neurologist now made a further examination and advised that “air pictures” should be taken. However, we were fortunately able to establish the diagnosis without submitting the patient to the ordeal of ventriculography.

And thus it was five days after admission to hospital, I saw the patient for the first time. Standing by the bedside I considered the history. The most striking feature was the sudden onset of the illness, with diplopia. This clearly pointed to an attack of acute ophthalmoplegia. The lesion was therefore almost certainly in the mid-brain affecting the nuclei of the oculo-motor nerves, extending slightly to involve the adjacent pyramidal tracts, chiefly on the right side. The most likely cause was a patch of minute hæmorrhages. As I stood contemplating the various possibilities there came to my mind a paragraph I had read recently in a book (1) referring to the condition described by Wernicke in 1881 (2) as acute hæmorrhagic polio-encephalitis superior, which had been subsequently shown to be due to deficiency of vitamin B₁. I remembered that a similar disease, known as Chastek paralysis had been produced in foxes by feeding them on a diet consisting largely of raw fish, which could be prevented by adding aneurin to the food. As Osler wrote: “To study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all.”

Turning to my house physician I said, “Do you think this can be a case of Chastek paralysis?” Receiving no reply I advised that enquiry should be made into the patient's dietary and alcoholic history, and that the blood pyruvate level should be determined before and after the administration of dextrose by mouth.

We learned that the patient had been a heavy consumer of alcohol; at one time he took as much as ten double whiskies in an evening. Alcohol was a favourite topic of his conversation, and he would ask the ward-clerk if he had been out the night before and what he had had to drink, and would boast of his alcoholic capacity.

At this time he was inclined to be impatient with the nurses, threatening to strike them and resenting carrying out instructions. The ward sister described him as being somewhat “rumbustious,” an expressive word which may have the same significance as “robustious” which Hamlet used when addressing the players. “O, it offends me

to the soul, to hear a robustious periwig-pated fellow tear a passion to tatters."

The officer was an Engineer Captain, a powerful muscular man, with Atlantean shoulders, 5 ft. 7 in. tall, and weighing over 15 stones. He was no mean athlete, having been a first class wrestler and an equestrian competitor in the Olympic games. He often boasted what he would do to upset the ward rounds, and would playfully threaten to crack the medical clerk's ribs, as if he were Charles, the Duke's wrestler. Later, however, as his sight improved, he became more co-operative and helpful in the ward. About fifteen years previously, while riding a motor-bicycle, he told us that he had noticed double vision for about five minutes. Six years ago, when he was smoking between sixty and seventy cigarettes a day, he had an attack of nicotine poisoning, with nausea and vomiting.

Wortis *et al.* (3) had shown that in the condition known as Wernicke's encephalopathy there is a disturbance of pyruvic acid metabolism. Pyruvic acid is formed by hydrolysis and oxygenation of glucose, and pyruvic acid depends for its further breakdown on thiamine pyrophosphate. Thiamine pyrophosphate is formed from vitamin B₁. The brain depends for its proper functioning on oxygen and a carbohydrate substrate formed by the breaking down of glucose. As Sherrington (4) writes: "Glucose, the typical physiological sugar, is urgently important to the brain. The brain draws it from the blood. It does not, as do some organs, take it into storage. It takes it to use at once. . . . Without vitamin B the brain cannot make the proper use of glucose as a food. Thought and behaviour alter. If the conditions be prolonged, unconsciousness ensues, and if prolonged further the brain cells are permanently damaged."

If vitamin B₁ is lacking in the diet the breaking down of glucose is arrested at the pyruvic acid stage and pyruvic acid accumulates in the blood. In such cases when dextrose is given by mouth, in addition to the fasting blood pyruvic acid being above normal, the blood pyruvic acid rises higher than in the normal curve and remains raised for a longer time. The normal fasting blood pyruvic acid is between 0.77 and 1.17 mg./100 c.c.

The test was now carried out and we found that the patient's fasting blood pyruvic acid content was 1.36 mg./100 c.c., and after taking 100 G. dextrose by mouth the content was 1.53 mg./100 c.c. at 1 hour, and 2.19 mg./100 c.c. at 2 hours. In a control experiment the fasting level was 1.03 mg., and the figures at 1 hour and 2 hours after the administration of dextrose were 1.24 mg. and 1.41 mg./100 c.c. The pyruvic acid retention test therefore gave a positive reading, indicating vitamin B₁ deficiency.

Before beginning treatment with vitamin B₁ injections the nature

of the ophthalmoplegia was more fully investigated by an ophthalmic surgeon.

The ophthalmic surgeon's report: "There is a partial right III nerve paralysis, involving the internal and inferior recti. In addition the pupil reaction is weak from the same cause. The right disc is slightly blurred. The Hess chart shows paresis of the right inferior rectus, overaction of the left superior rectus, and weakness of both internal recti. At the moment there is no treatment for the eyes, but later on it would be worth while considering an operation, providing the patient's general condition is sufficiently good."

Injections of Benerva mg. 25 were given every other day, together with one Beplex capsule by mouth t.i.d. During the next week the diplopia rapidly improved. The patient was in a bed at the end of the ward and he used as his test objects a patient, Mr. Feather, in a bed at the opposite end of the ward, and a spot on the ceiling. At first he could see two Mr. Feathers and two spots on the ceiling. In a few days he could only see one spot on the ceiling, but still two Mr. Feathers. Soon the two Mr. Feathers merged together and after ten Benerva injections the diplopia had disappeared, and the pyruvic acid retention test had returned to normal. The ophthalmic surgeon reported that the Hess chart was now practically normal. Twenty-two Benerva injections were given before the patient left the hospital, completely cured. The gallant captain was seen again two months later, and was still quite well.

Comment. What is now usually known as Wernicke's encephalopathy was first described by Wernicke (2) under the title of "Acute hæmorrhagic polioencephalitis superior" in his "Text Book of Brain Diseases" in 1881. The account is based on three cases. The first was a seamstress, twenty years of age, who was admitted to hospital on December 6th, 1876, with sulphuric acid poisoning. She was discharged on January 6th, 1877, and remained well until February 3rd, 1877, when she developed a staggering gait, yawned prodigiously, became somnolent and took to her bed. In addition she vomited, and complained of impairment of vision, photophobia, giddiness and a heavy feeling in her head. She was again admitted to hospital on February 11th, 1877, when the following eye signs were noted. The eyes could not be opened more than 1 cm., except on looking upwards. They could be closed completely, but not firmly. There was slight ocular convergence, and on looking up and down coarse nystagmus was apparent. Movement to the left of both eyes was much impaired, particularly of the left eye which did not diverge beyond the mid-line. This also applied to the right eye. On fixing a near object the left eye converged more than the right. The pupils were equal and reacted sluggishly to light. There was moderate swelling of both discs. There

was a slight right lower facial palsy. The patient could walk only if supported and was very weak, she became progressively more drowsy, complaining of headache and stiffness of the neck. Death occurred on February 13th.

Post-mortem examination showed the walls of the third ventricle of a rose colour for a distance of 3 to 5 mm., with numerous punctate hæmorrhages. The changes were symmetrical on the two sides and particularly evident in the region of the middle commissure. The corpora quadrigemina, pons, medulla and cord were normal. The retinae showed numerous hæmorrhages. Microscopical examination revealed that the hæmorrhages were mostly along the vessels.

There was no history of alcoholism in this case, but the stomach was dilated, with ulceration and pyloric stenosis following the sulphuric acid poisoning.

The second case was a thirty-six-years-old Scotsman, a piano teacher, who was accustomed to take large quantities of brandy. He was admitted to hospital on June 18th, 1877, in delirium tremens. It was noted that the eyes were almost fixed in the mid-line position, and on following objects he moved his head and not his eyes. He gradually became somnolent and died on June 26th. Post-mortem examination revealed changes similar to those found in the first case.

The third case was a man thirty-three years of age, a heavy spirit drinker, who was admitted to hospital on March 10th, 1878, on account of delirium. During the previous two days he had complained of diplopia. He was found to have bilateral paralysis of the VI cranial nerves, the pupils and the other oculomotor nerves being normal. The discs were hyperæmic, but not swollen. On March 13th the VI nerves were still paralysed, and there was now impairment of nasal movement of the eyes. Two days later downward eye movements were impaired, and upward eye movements were slightly defective. There was marked optic neuritis in the right eye and a single retinal hæmorrhage was seen. Death occurred towards noon on this day. Post-mortem examination showed the middle cerebral commissure full of small punctiform hæmorrhages. Hæmorrhages were also present in the third ventricle and in the grey matter of the fourth ventricle.

Ramsay Hunt (5), writing on the subject in 1906, said that the Wernicke syndrome had undergone certain changes and modifications. Paralysis of the extremities may result from invasion of the white matter, and the inflammatory process may extend to the medulla and cord, thus constituting a polioencephalitis superior et inferior. Hunt also remarked that the termination is not necessarily fatal; partial or complete recovery may occur. He suggested the hæmorrhages might be due to a toxin. In 1908 Krumbhaar (6) described a case in a clerk, forty years of age, who was accustomed to take one whisky and five

beers a day, with occasional alcoholic debauches. He developed drowsiness and oculomotor palsies. Post-mortem examination showed numerous small capillary hæmorrhages in the grey matter surrounding the aqueduct of Sylvius and in the wall of the third ventricle. Generalized tuberculosis was also present. Kinnier Wilson (7) in 1940, referring to Wernicke's original description says: "Alcohol is not the unique cause, and its action may in some examples be secondary."

Alexander and his co-workers (8) introduced the view that the Wernicke syndrome is due to deficiency of vitamin B₁. They showed in 1938 that the lesions in Wernicke's polioencephalopathy in man, and those he and his colleagues produced in thiamine-deficient pigeons, foxes and fish, were identical in their topographical distribution and in their morphological and histological characteristics.

In 1942 Wortis and his colleagues (3) published their pyruvic acid studies in the Wernicke syndrome. They found that many examples of the syndrome occurred in non-alcoholic persons. They studied the disease in three non-alcoholic patients, and in thirty-one chronic alcoholics. The three non-alcoholic patients had taken very little food, in two cases they had refused to eat owing to depression, in the third case on account of vomiting associated with tuberculosis. They considered that the syndrome was probably due to a combination of several nutritional deficiencies. The ophthalmoplegia was found to respond to thiamine, but not to nicotinic acid, riboflavin or pyridoxine. They also found that the ophthalmoplegia is always preceded by an acute peripheral symmetrical polyneuropathy. Apart from other complications all patients recovered when given an adequate amount of vitamin B₁.

During the 1939-45 war attention was again directed to the effect of deficiency of vitamin B₁ on the central nervous system. Under the heading Cerebral Beriberi or Wernicke's Encephalopathy, de Wardener and Lennox (9) described fifty-two cases in a Singapore prisoner of war hospital, with twenty-one deaths. Early treatment with thiamine injections produced a rapid cure. In addition to oculomotor palsies there was anorexia, vomiting, mental detachment, disorientation and a semi-comatose condition. Post-mortem examination showed hæmorrhages in the mammillary bodies.

Cruickshank (10) in 1950 also described cases occurring in Changi prisoner of war camp, Singapore. Injections of 2 to 4 mg. of vitamin B₁ caused a rapid disappearance of vomiting and ophthalmoplegia.

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ANGINA AND ANÆMIA

"The clouds return after the rain."

ECCLESIASTES

WHEN I first saw Mr. L. in December 1943 he was suffering from only a mild degree of chronic bronchitis and emphysema, and there was nothing to suggest that his future course was to differ from that of the many cases of a similar nature I had previously treated.

In the past he had undergone four operations; for removal of stone from the right kidney ten years ago, for fistula, for hæmorrhoids, and for deflected nasal septum. And yet, during the next nine years he was destined to have six more operations. The patient was sixty-three years of age, active and energetic, except when kept in doors from time to time in the winter owing to colds which went to his chest. He was a well-preserved man, about 5 ft. 6 in. in height and just over 10 stones in weight, with hair, dyed a reddish-brown, parted on the right side and adequately covering his cranium. I found him querulous and self-centred. His features were clear cut, with a prominent nose and thin lips, and his eyes were inclined to water which he attributed to the "catarrh," a source of constant complaint.

I was not consulted again for another four years, the chief complaint being still the "catarrh" which caused choking attacks, headaches, dizziness and a little shortness of breath. The blood pressure had risen from 140/90 mm. Hg. to 150/90 mm. Hg., and the urine, which was normal at my previous examination, now contained a trace of albumin and about two per cent of glucose. A dextrose tolerance curve showed that the condition was one of renal glycosuria and not of diabetes mellitus. Four months later, in February 1948, Mr. L. had an attack which appeared to be due to spontaneous hypoglycæmia, a condition that is sometimes associated with renal glycosuria. It was characterized by sweating, faintness and a severe headache, and was relieved by eating sugar. The blood pressure had now risen to 174/110 mm. Hg. A further feature, which was becoming very troublesome, was severe belching, both by day and by night, and I wondered whether this might be a manifestation of early right ventricular failure, and due to passive hyperæmia of the gastric musosa.

I heard nothing more for another eight months, when I was again asked to examine Mr. L. on account of substernal pain and discomfort, provoked by walking, with severe gastric flatulence. In the meantime he had been examined by two cardiologists, one of whom said that the electrocardiogram was suspicious of coronary thrombosis, whereas

the other assured the patient that his heart was perfect. The patient, however, and his relatives, were still very worried whether or not the pain was due to angina pectoris. I took an electrocardiogram which showed no evidence of cardiac ischæmia; but the heart was slightly enlarged, and the pressure had fallen to 156/88 mm. Hg. There were now râles at the base of each lung, and the liver was palpable 2 in. below the right costal margin.

In January 1949 Mr. L. was again brought to me by his doctor,



FIG. 33. Para-oesophageal hernia.

and this time on account of anæmia which did not respond to iron administered orally. He had become more short of breath on walking and was very pale. The blood count was Red cells 3.5 millions per c.mm., Hb. 37 per cent, C.I. 0.5, White cells 7,000 per c.mm., polymorphs. 62 per cent, lymphocytes 37 per cent, monocytes 1 per cent. It appeared possible that either the anæmia or the hypoglycæmia might account for the anginal symptoms, but the cause of the anæmia was obscure and I advised admission to hospital for further investigations.

Nothing abnormal was found on rectal examination and there was no evidence of bleeding from piles. The fractional test meal showed a climbing acid curve, the test meal left the stomach in an hour, and no blood was present in the stomach contents. The van den Bergh direct and indirect reactions were negative. There was therefore no evidence of an achlorhydric or of a hæmolytic anæmia. The occult blood test on the fæces, however, was strongly positive, so that the anæmia was probably due to bleeding somewhere in the alimentary tract. The barium meal revealed the presence of a large para-æsoophageal hernia, into which about one-third of the stomach protruded (see Fig. 33). The bleeding therefore probably occurred from congestion of the mucous membrane of the herniated portion of the stomach, a condition of gastrostaxis.

Despite further intensive iron therapy the anæmia did not improve and a few months later a left phrenic crush operation was performed. This was rapidly followed by relief of the flatulence and indigestion, and the anæmia gradually improved with oral administration of iron, the hæmoglobin rising to 97 per cent within six months.

Mr. L. now engaged a young and good-looking trained nurse, who acted as a companion-housekeeper, nursed him on his return home from hospital or nursing home after his subsequent operations, and continued to supervise his physical welfare during the several years I knew him.

One operation now followed another, as in old age "the clouds return after the rain." The patient was sufficiently well to have a prostatectomy performed following an attack of retention of urine. A month or so later the effects of the phrenic crush were wearing off, and the left diaphragm was moving again with respiration. The blood count also began to deteriorate, the hæmoglobin falling to 80 per cent, and the surgeon agreed to make the diaphragm paralysis permanent on the left side by avulsing the left phrenic nerve. This had a most beneficial effect, no further symptoms of indigestion occurring and the anæmia being completely cured. The patient's troubles were not, however, at an end, as a little later both antra were opened on account of the "catarrh." Unfortunately the operation did not relieve the symptoms. This was followed by a repair operation for left inguinal hernia, which was a complete success, and finally, in November 1951, after two attacks of severe renal colic a small stone was removed from the left ureter. Having successfully weathered all these storms Mr. L. now sailed into quiet water. From time to time he was still troubled by hypoglycæmic attacks, with faintness, sweating and dyspnœa, but he continued to visit his office in the city several days each week and to walk a mile or more each day, and there was no return of the anæmia or of the anginal symptoms. He still, however,

retained the services of his trained nurse, who had looked after him so well for so many years.

Comment. Most patients who suffer from anæmia due to gastric bleeding associated with hiatal hernia are women, and over the age of fifty years. Only occasionally is there traumatic ulceration in the herniated portion of the stomach. In an Editorial in *The Lancet* (1950, i, 176) entitled "Diaphragmatic hernia as a Cause of Anæmia" we read: "The treatment, ideally, would be surgical repair of the hernia and return of the herniated stomach to the abdominal side of the diaphragmatic division. This has been done successfully in the younger cases. But in the patients over 60 the advisability of operation is doubtful. Fortunately . . . nearly all the patients respond well to iron."

No mention is made of the much simpler operation of phrenic crush, followed six to eight months later by phrenic avulsion if the crush operation has proved successful. It is strange how difficult it is to persuade surgeons to perform this minor operation. Further, in the case I have related, the anæmia did not respond to iron therapy before the phrenic crush operation.

STEATORRHŒA

A LADY consulted me in the late summer of 1952 on account of recurrent attacks of diarrhœa associated with lassitude, so much so that she felt "like an invalid." She was now thirty-six years of age and happily married for the second time. Previously she had enjoyed good health apart from frequent colds, and, at the age of five, had an operation for a tuberculous gland in the neck. She was now resident abroad where her husband was employed, and had lived there during the previous two and a half years.

The diarrhœa began in England in 1948, a year after her second marriage. About this time she consulted a physician in the West Country where certain investigations were carried out. The barium enema showed a lack of haustration in the descending colon. On cholecystography the gall-bladder was seen to fill rather poorly, but it emptied well after a fatty meal, and there was no X-ray evidence of gall-stones. An intravenous pyelogram showed no abnormality. The most striking finding was an abnormally high content of fat in the fæces, the total fat being 46 per cent, of which 60 per cent was unsplit. A diagnosis of chronic cholecystitis and chronic pancreatitis was made, and the patient was advised to take a high protein and low fat diet, and was given Panteric tablets. Some improvement was noticed for a short time with this treatment, but the tendency to attacks of diarrhœa persisted, and the patient was always tired and listless.

In August 1952, a month before I was consulted, Mrs. W. experienced an attack of diarrhœa surpassing in intensity and frequency any previous one, and although advised to ignore it, she felt that she must take further advice. I think she was justified in being worried about this recurrent looseness of the bowels, and had she been familiar with Celsus and his aphorisms she might have quoted one which should have silenced her critics. Those readers who looked up Celsus in his native tongue before entering for the M.R.C.P. examination, may recall that he wrote: "A looseness is beneficial to health, if it continues but one day, or even longer a time, provided it is not attended with a fever, but ceases before the seventh day. For by this means the body is purged of what is noxious. But if it continues long it is dangerous; for it sometimes causes gripes and fevers, and wastes the strength; and sometimes when it has been neglected several days, it is hardly cured."

The patient measured 5 ft. 4 in. and weighed 8 st. 4 lb. She was of small build, but there was no evidence of wasting. Her hair was fair and in good condition, complexion sallow, features small but

regular. She was vivacious but sensible and showed no evidence of nervous instability. I found no abnormal signs except slight tenderness just to the right of and below the umbilicus. The previous examination of the fæces indicated that the steatorrhœa was of the pancreatic type, probably associated with attacks of colonic spasm, although there was never any abdominal pain during the diarrhœal episodes. My advice was that she should continue with a fat poor diet and I ordered her a belladonna and alkali mixture.

I had no more news of her until she next visited England, eleven months later. She then told me that there was no improvement, that her motions were always loose, three or four a day, and that the only medicine which gave any relief was a mixture of bismuth and kaolin. A barium enema examination had been made abroad, which showed the colon to be a little elongated with some spasm. There was diffuse tenderness over the ascending colon. I ordered Sorlate capsules, with the hope of increasing the fat absorption, and I prescribed Bellafoline and phenobarbitone in a tablet.

A month later Mrs. W. came to see me again. She felt much better in herself, but unless she took the bismuth and kaolin the stools immediately became loose. A doctor had recently suggested that she might be suffering from hyperthyroidism, although there was nothing in the clinical picture to support this view. As the patient was now willing for further investigations to be carried out I decided first to determine whether or not she was suffering from thyrotoxicosis and then to have the fæces examined again.

The basal metabolic rate was +13 per cent, and after two weeks' iodine treatment, it was practically the same, +11 per cent, which excluded a diagnosis of hyperthyroidism. The fat content of the fæces was 37.4 per cent, split fat being 31.3 per cent and unsplit fat 6.1 per cent. This indicated that the steatorrhœa was not due to pancreatic insufficiency, but to lack of absorption in the intestine, possibly associated with deficient biliary excretion.

During the next month the patient gave up all medicines and her condition steadily deteriorated—the bowels were opened three or four times a day and she described her motions as “very loose and runny.” She now consented to come into hospital for further investigations, with the following results:—

Fæces: Total fat 42 per cent. Unsplit fat 9.7 per cent. Split fat 32.3 per cent. Microscopical examination of the fæces showed no abnormality. *Cultures:* No pathogenic organisms isolated. *Blood count:* Hb. 97 per cent. White cells 5,400 per c.mm., polymorphs. 43 per cent, lymphocytes 48 per cent, monocytes 9 per cent. *Sedimentation rate of the red cells:* 5 mm./1 hour (Westergren). *Serum calcium:* 9.6 mg./100 c.c. *Barium enema:* “The barium passed

without obstruction round to the cæcum. There was no filling defect or other evidence of abnormality and the mucosal pattern was normal. Evacuation of the enema was also normal." *Cholecystogram*: "Normal filling and emptying, no evidence of stones." The patient's temperature was normal during her stay in hospital but the looseness of the bowels continued.

What could account for the steatorrhœa and diarrhœa? Should I have to send her out from hospital with the problem unsolved? These were the questions which I revolved in my mind, as I stood by her bedside after reading the reports. And then the possible solution to the problem dawned on me; turning to my house physician, I said we will have a barium meal. And this gave us the answer. *Barium meal*: "The barium passed down the œsophagus with no evidence of abnormality. The stomach canalized normally and showed no X-ray evidence of abnormality. Nothing abnormal was seen in the duodenum. The motility of the meal in the colon was rapid, the head of the meal being in the splenic flexure at one hour, and in the rectum at three hours."

The rapid transit through the whole of the alimentary canal would account both for the looseness and frequency of the bowel action, and for the excess of normally split fat in the fæces.

Roughness of the skin was another complaint and this might be due to deficient absorption of vitamins in the food.

I now proceeded to put the theory to the test. The patient was given a pill of codein. phosphate gr. $\frac{1}{4}$ b.i.d., and Pro-Banthine mg. 15 tablet once or twice a day if the diarrhœa persisted. The improvement was very rapid, and an examination of the fæces a week later showed the fat content normal, the total fat being 18·9 per cent of dried fæces, the unsplit fat 7·7 per cent, and the split fat 11·2 per cent. No psychological cause was found which might have accounted for the intestinal hurry. Mrs. W. was advised to take a normal diet, but should she have any diarrhœa to restrict the fats temporarily. When seen several weeks later the bowels were still functioning normally.

Comment. Was there an error in the first fat examination of the fæces, which showed the excess of unsplit fat, or was the intestinal hurry so great that the pancreatic ferments had not time to do their work?

POLYCYSTIC DISEASE OF LIVER AND KIDNEYS

A MARRIED woman, forty-nine years of age, was admitted to hospital on account of pain in the region of the right kidney, radiating up to the right costal margin and referred also to the right shoulder. The pain had recurred every two or three months for the last two years. The patient also complained of periodical throbbing headaches, and attacks of nausea, shivering and fever. For about four years she had noticed vague tenderness in the centre of the abdomen. Between the attacks of abdominal pain she was well, except for an uncomfortable

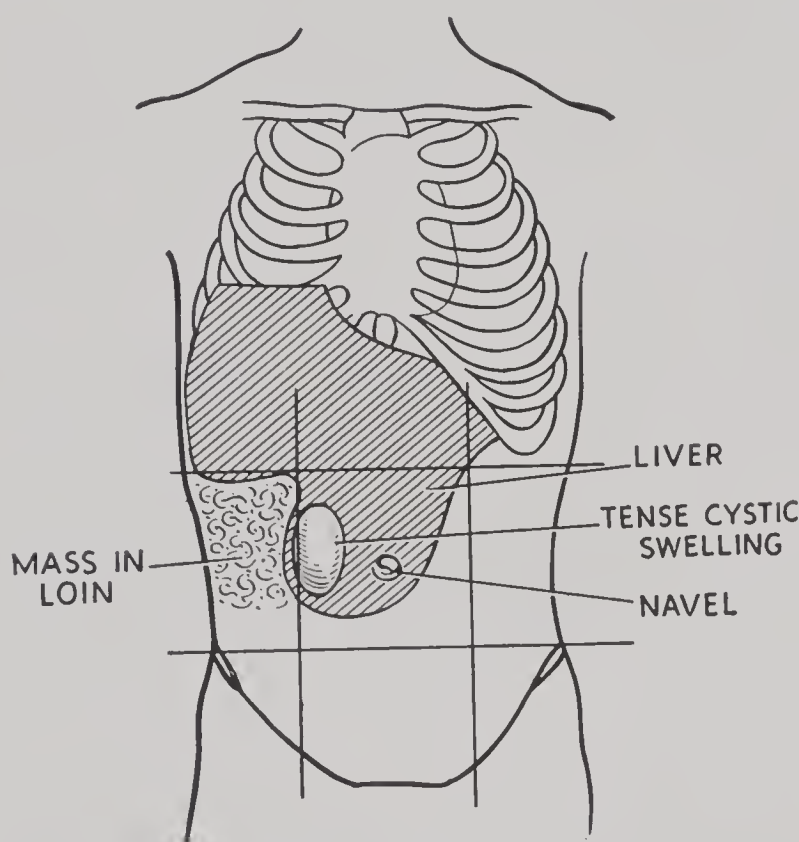


FIG. 34. Diagram. Abdominal findings in polycystic disease of liver and kidneys.

feeling in the right side, which was relieved to a certain degree by an abdominal belt. A diagnosis of cholecystitis and floating kidney had been made before admission to hospital.

The patient was born in India and had only come to England recently. Two years previously, when stranded in the jungle, she had been forced to drink water from a pond at which animals drank, and about four months later she developed typhus fever. She had been treated in India both for malaria and dysentery. Just before admission, the doctor had found the blood pressure to be 170/110 mm. Hg.

The patient was thin, with a dark skin. No signs of disease were found in the heart or lungs, and the blood pressure on admission to hospital had dropped to 140/90 mm. Hg. The abdomen was easy to examine, as the wall was lax and thin, but the interpretation of the abdominal findings presented difficulties. The liver was enlarged, extending on the right side to just below the navel. A visible swelling was present in what appeared to be the right lobe of the liver, and

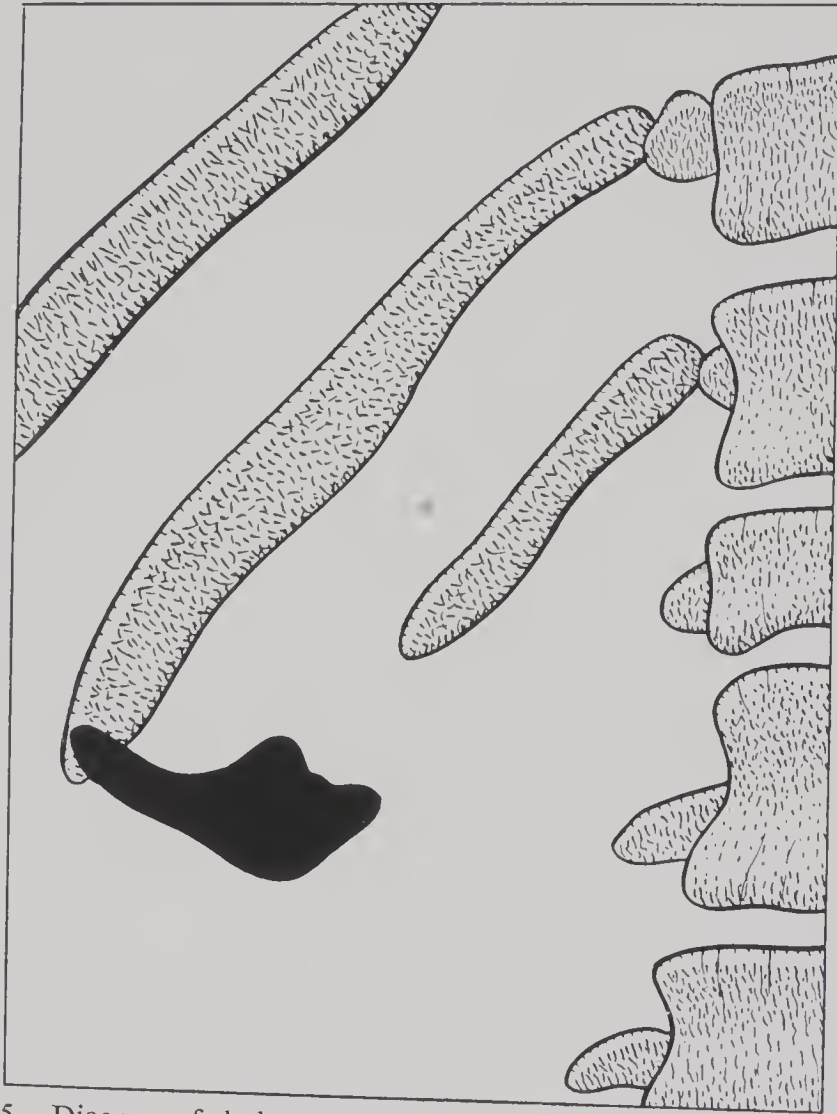


FIG. 35. Diagram of cholecystogram showing semi-circular impression on gall-bladder due to cyst in liver.

this swelling felt cystic. In the right flank, and not clearly separated from the right lobe of the liver, was a firm and somewhat irregular swelling, movable on bimanual palpation, which was thought to be the right kidney. When the patient lay on the right side, the left kidney could be felt, but it did not appear enlarged. The spleen was not palpable. The abdominal findings are indicated in the diagram (see Fig. 34). The patient's temperature was raised to 99° F. on a few evenings during the first week in hospital, after which it was normal. The urine contained no albumin, and a catheter specimen showed

a few pus cells, and a scanty growth of *Bact. coli*; no hæmosiderin granules were found. Examination of the fæces showed no cysts, ova or parasites. The blood Wassermann reaction was first returned as positive, but a repeat examination gave a doubtful positive reading, and the Kahn test was negative. The white cell count was normal, but the sedimentation rate of the red cells was raised to 21 mm. (Wintrobe) at 1 hour. The barium meal showed the stomach and duodenum slightly displaced to the left by the enlarged liver, and an area of calcification was visible in what was considered to be a cyst in the liver. With a barium enema the transverse colon and hepatic flexure were depressed by the mass in the right lumbar region, which did not appear to have any relationship to the bowel. X-ray examination of the chest showed the right diaphragm a little elevated and slight dorsal scoliosis to the right, but no other abnormality. The gall-bladder was examined radiographically, and the cholecystogram indicated that it filled and emptied normally, but there was a semi-circular impression on its wall, which was thought to be due to extrinsic pressure from above (see Fig. 35).

Certain liver function tests were now carried out. The Takata-Ara test was positive. The galactose tolerance, the bromsulphthalein, the alkaline phosphatase, the blood bilirubin, the blood proteins and the thymol turbidity tests were all negative.

The intravenous pyelogram showed that both kidneys were enlarged, and the appearances were said to be those of polycystic disease. The typical X-ray findings consist of lengthening and compression deformity of the pelvis and calyces, producing a "spider" or "dragon" shape appearance. Clear cut crescentic indentations may be seen in the calyces and pelvis, sometimes with a "half shadow" due to the projection of the cyst into the calyces or pelvis. The blood urea and the Van Slyke renal function test were normal.

Various suggestions were made to explain these clinical and laboratory findings. A surgeon reported that the liver enlargement was due probably to gummatous infiltration or possibly to a cyst of the liver, and that the gall-bladder was deformed possibly by the liver substance, but more probably by the kidney.

The patient was now treated with potassium iodide gr. 30 t.i.d. for ten days without any improvement. In the meanwhile the repeat examination of the blood Wassermann reaction was to hand, together with the Kahn test, which rendered a diagnosis of syphilis improbable. The Casoni test of hydatid disease was found to be negative. Daily intramuscular injections of emetine hydrochloride gr. 1 were given for six days, empirically, on the supposition that having suffered from dysentery in India, the hepatic lesion might be due to amœbic hepatitis. Strangely, there was considerable clinical improvement after a week,

the patient feeling better and the liver being less tender. The patient was now shown to a class of post-graduate students, the only suggestion made being that the condition might be one of hæmochromatosis. This was unlikely, the colour of the skin was presumably racial, there was no sugar in the urine, and no hæmosiderin granules were found in the urine. It was agreed that the kidneys were polycystic, but the renal lesion had not progressed to the stage at which evidence of renal failure could be obtained, and the rise of blood pressure was not constant.

I asked the surgeon to see the patient again, eighteen days after his previous examination. He reported that the liver was no longer tender, the right lobe being large, with a localized hard area on a tongue of liver substance covering perhaps the gall-bladder, and, in addition, possibly a cyst in the liver. In view of the improvement with emetine, he considered that a calcifying cyst was probably present. Three days later laparotomy was performed. The liver was found to be grossly enlarged, containing multiple cysts. A cyst, about the size of a grapefruit was present on the under surface of the right lobe of the liver, deforming the gall-bladder. The large cyst was aspirated and contained clear fluid, and a piece of its wall and of the liver were removed for biopsy. The gall-bladder and pancreas appeared normal. Both kidneys were polycystic, the right kidney being larger and quite separate from the liver.

Microscopical examination showed the cyst wall fibrous with patchy areas of calcification. The liver section was normal except for a localized collection of a few cells containing excess of fat.

The patient made a good recovery, and left the hospital feeling well.

Comment. Looking back at this case it is surprising that the correct diagnosis of polycystic disease of liver and kidneys was not made before the operation. We were first misled by the incorrect Wassermann report. On discussing the case with my house physician he said that he did not think that cystic disease of the liver would give rise to fever. The temperature, however, was very little raised, and it might have been accounted for by other causes, such as an intrahepatic cholangitis. The absence of leucocytosis was opposed to a diagnosis of amœbic hepatitis, and the clinical improvement with emetine is difficult to explain. Sufficient importance does not appear to have been paid to the fact that the swelling in the liver felt cystic on clinical examination, and also to the X-ray finding suggesting patchy calcification in a cyst in the liver. None of the smaller cysts on the surface of the liver could be felt. The fact that a correct diagnosis of polycystic renal disease was made before the laparotomy, should have given the clue to the nature of the hepatic lesion. Despite the clinical improvement after the operation the danger of renal failure still persists.

TEN MINUTES TOO LATE

*“. . . as this fell sergeant, death,
Is strict in his arrest.”*

HAMLET

I WAS awakened from my first sleep, just before midnight, on November 4th, by the telephone bell. It was a Saturday, and the Guy Fawkes celebrations were in full swing as the traditional Fifth fell that year on a Sunday. A general practitioner was ringing from a patient's house, near a small village in the heart of the country, about thirty-five miles from London.

The doctor told me that he had been called there earlier in the evening to find a man, forty-six years of age, in a state of coma. I had seen the patient from time to time for nearly twenty-one years, and latterly he had suffered from diabetes mellitus, enlargement of the heart and high blood pressure. The doctor went on to say that it was the first time he had seen the patient who had only recently moved to the district. He had given an intravenous injection of 50 units of insulin, presuming the coma was due to hyperglycæmia and ketosis. I was familiar with the patient's history. I knew he was a severe diabetic, taking a large daily dose of insulin, zinc protamine and soluble, and that he was prone to attacks of hypoglycæmia which were relieved by dextrose.

Fearing that a mistake had been made in the treatment I enquired whether the patient could swallow, and was told that he was now quite unconscious, with Cheyne-Stokes breathing. I advised that no more insulin should be given, and that an intravenous injection of dextrose should be administered at once, or a stomach tube passed and dextrose introduced that way. The doctor answered that he had not the facilities for doing this. I then suggested moving the patient to the nearest hospital, but was met with the reply that there were no residents in the local hospital and an intravenous injection was impracticable. As a last resource I asked the doctor if he had any adrenaline, and on learning that he had 5 c.c. with him, I recommended that this should be injected at once, intramuscularly. There was nothing more I could do, and so, as I was not asked then to come and see the patient, I retired again to bed.

At 3 a.m. I was again aroused from sleep by the telephone bell, the doctor saying that there had been a slight improvement after the adrenaline injection, but the patient was now again comatose, and would I come at once. I said I would, although I thought I should probably

arrive too late. I expected also that I should have difficulty in finding the house in the middle of the night, as it was right off the main road. Half asleep, and fumbling with a pencil I wrote down the directions. I had to go to a village on the main road from London, then turn left, go over a common to another village, and turn left in the centre of the village. The directions, as I wrote them down, finished like this: "When you get to the Blue Anchor go along the road to Three Elms, the village near where the patient lives. Do not go right into the village. Turn left on the D—— road, and the house is almost half a mile along on the right, the name is fixed to a tree. His wife will look out of the window for you. It will take you about an hour and a half."

I thought this was the usual optimistic forecast of the local doctor who is familiar with all the roads and houses in his neighbourhood, and who wishes to minimise the consultant's difficulties. I have never made up my mind why general practitioners so often do this.

After calling at the chemist for ampoules of dextrose in saline for intravenous injection, and a supply of adrenaline, I set forth. Fortunately it was a fine, starry night, with a waning moon, but the roads were frosty and slippery in patches, and a mist hung over the valleys.

I made a good journey along the main road and then across the common. My course now lay between thickly foliated trees, whose gold-bronze leaves, with the frosted road between, were sharply outlined in the oval glare of the headlights, and from time to time rabbits scurried across my path, with their white tails gleaming against the dark background of their furry coats. I must have passed the Blue Anchor without noticing it when, a little further on, I saw a sign-post marked "Three Elms $1\frac{1}{4}$ miles," and looking at my directions with a torch, I found I had to turn to the left before reaching the village. And here my difficulties began. I now spent over three-quarters of an hour within a mile or so of my destination, completely alone in the country, and unable to find my way. Through the village I went and then came back trying every little cart track or lane. Each one ended in a farm yard. I noticed a lamp burning in a window, the first sign of life I had yet found, and hoping for help I drove up to the cottage. I left the car—"Ah, bitter chill it was!"—and knocked on the door. It was opened by a girl dressed in trousers and a leather jerkin with a lambswool collar, drinking something steaming from a mug. The room was heated by a gas stove and looked bright and cheerful after the cold outside. I wondered what she was doing alone in the middle of the night. The girl did not know the house I wanted or the D—— road leading to it, but told me I had passed the Blue Anchor and if I went back I couldn't miss it. I decided to go back, find the Blue Anchor, and try each turning between the inn and the village. Still I did not find the inn and every turning led to more farm yards,

and so I wandered "to and fro in ways unknown" until I saw a bicycle coming towards me. Stopping the rider, whom I took to be a young man, I said "I am a doctor looking for a patient's house. Can you tell me where the Blue Anchor is?" She replied, for it was the same girl, probably a land girl setting out for the morning milking, "You've already asked me that. It is straight back there, you can't miss it." Once more I went back along the road and this time saw the inn lying in a bend of the road. I was still no nearer finding the side road I wanted, as I had already tried all the turnings to the left, but after driving about two miles beyond the village, with joy I saw a comparatively wide road, labelled "D——." Going along this for about half a mile I easily found the house on the right, with the name on the tree outside, showing up clearly in my headlights.

It was a large house, standing in its own grounds and divided into flats. Three or four cars were parked near the main entrance, and there was a light in an upstairs window, but no one looking out for me. The dawn was just beginning to break. I pushed open a swing door, and along a corridor were several oak front doors. Thinking I remembered the doctor telling me the patient's flat was on the ground floor, I rang the bell of No. 1. The door was opened by a lady of about fifty-five or sixty years, with a wrinkled, pale, sad face, who said "Dr. Beaumont?" "I'm too late," I replied. "Yes," she answered, "he died ten minutes ago." I looked at my watch, it was ten minutes to six. For three-quarters of an hour I had driven around trying to find the side turning. I felt resentful, aggrieved and frustrated that I had not received better directions or that no one had been sent to meet me.

The patient's wife then came into the lounge, crying, and we went into the bedroom. I saw a figure on the bed, covered by a blanket. The doctor lifted up the corner of the blanket and showed me the face of my old patient, sadly transformed from its normal firm lines and pink and white complexion.

We returned to the lounge, I was given a sandwich and a cup of coffee and talked to the doctor. He told me of the fame of the local bonfire held annually on Guy Fawkes night, and how many people came from long distances, in motor coaches to see it. The traffic was so dense on the country roads when he was called out earlier in the evening, that it took him an hour and a half to drive three or four miles. The widow now came to me, still crying, and said, "Come in here and see his books." She took me into a large sitting-room, leading off the lounge. Ranged along the walls were several new book cases, with glass fronts, filled with popular editions. On the floor were wooden boxes, not yet unpacked, for they had only moved into this flat a few weeks before.

The widow held me by the hand, weeping and saying "I can't

believe it has happened. He has so many times nearly died before and come round." I answered "It is dreadful. I am so sorry for you. Tell me what happened." And this was her story:—

"We went to see the bonfire this evening. We had a window over the butcher's shop. He was not very well. We left him in the window and went to see the bonfire. When we came back we met him coming towards us. He could hardly walk. I thought he had been to the Pub. He wanted to drive the car home but I would not let him. I drove back. He collapsed when he got home into a chair in the lounge. I got him into the bedroom and helped him to undress. I then rang up the doctor but he was out. They told me where to find him. I spoke to him on the 'phone, and he said he would have great difficulty in getting to us owing to the crowds of people and cars and coaches on the roads. I assured him I would not ask him to come unless it was really necessary. My husband was unconscious now. The doctor arrived about 9 or 10 o'clock."

We went back into the lounge where the doctor was still sitting, talking to the dead man's mother and another relative. After a few minutes I said, "I must go now." The doctor came with me to my car, and enquired about my fee, to which I replied "I shall charge nothing."

As I set forth I thought of the story of the German professor of medicine who was called to see a patient in the country and found him dead on his arrival. A relative said, "I am sorry, Herr Professor, you have troubled yourself for nothing." He murmured, "*Vergeblich, nicht umsonst*"—"In vain, but not for nothing."

Driving homewards across the common the dashboard of the car suddenly glowed with a deep, rosy hue, the crimson rays pouring through the window behind me. At first I thought they came from a late bonfire, but, on getting out of the car, I turned and saw—

"Forth from his christall bed the sunne to rise
With rosie robes, and crowne of flaming gold."

IDLE THOUGHTS

Dogmatism and intolerance are the stigmata of a bad physician.

* * * * *

Patients undergoing lengthy treatment in a chest hospital make fewer complaints than those who are being treated for a short time in the wards of a general hospital.

* * * * *

The greatest bar to success in clinical medicine is aloofness on the part of the doctor.

* * * * *

Flatulent gastric distension occurring only when the patient is in bed, and disturbing sleep, is a symptom of fatigue rather than of indigestion.

* * * * *

No man can serve two masters, and no patient can be treated by two physicians.

* * * * *

Flatulent colonic distension may be due to oxaluria.

* * * * *

The administration of adrenaline to a patient with asthma who has an enlarged prostate, may be quickly followed by retention of urine.

* * * * *

Migraine is a manifestation of conscientiousness rather than of cleverness.

* * * * *

A patient may complain that his attacks of asthma are brought on by his wife's loud voice.

* * * * *

The strangely symmetrical involvement of joints in infective arthritis is unexplained.

* * * * *

Sudden blindness may be due to a chiasmal hæmorrhage.

* * * * *

Women are usually much less disturbed by high blood pressure than are men.

* * * * *

In any obscure illness particular attention should be paid to the mode of onset.

* * * * *

Pulmonary resection either kills or cures in pulmonary tuberculosis, thoracoplasty usually does neither.

* * * * *

Patients seldom have a positive Wassermann reaction nowadays, and if it is positive they do not have syphilis.

Part II

THE TRIALS OF THE TUBERCULOUS

* * *

RESUSCITATION IN CONGESTIVE FAILURE

“Let us endeavour to see things as they are.”

THE LIFE OF SAMUEL JOHNSON, LL.D.

THE TRIALS OF THE TUBERCULOUS

“Some think there were few Consumptions in the Old World, when Men lived much upon Milk; and that the ancient Inhabitants of this Island were less troubled with Coughs when they went naked, and slept in Caves and Woods, than Men now in Chambers and Feather-beds.”

A LETTER TO A FRIEND

MY first acquaintance with consumption came about in this manner. In the summer of 1913 I was nearing the termination of my six months' appointment as a house physician at the Middlesex Hospital, when the physician in charge of our beds asked me, at the conclusion of a Friday afternoon round, if I would care to accompany him to see a post-mortem examination on a case of his at the Brompton Hospital for Consumption and Diseases of the Chest.

This was my introduction to Brompton and I was fortunate in being appointed a house physician there, a month later, for a period of six months. There were six house physicians at Brompton, mostly selected from London teaching hospitals, and it was our duty to make a careful examination of each of the fifty-two patients under our care every week, and to record our findings on a chest diagram. Although I had been a house physician at Middlesex for six months, it was not until I had worked at Brompton for a further three or four months, examining patients daily in the wards and in the out-patient department, recording my findings in the notes, and comparing them with those of my chief and with the X-ray plates, that I truly learned to appreciate what I was hearing through my stethoscope, and could feel confidence in the accuracy of my findings. The X-ray plates in those days were of poor quality, and examination of the chest was then an art; today, with the great improvements in radiological technique, chest examination may be considered as a craft.

Treatment of pulmonary tuberculosis had then emerged from the empiricism of the Middle Ages, but there were no special methods available. Our mainstay was rest in bed for prolonged periods during the active stages of the disease, and, if such bed rest did not quickly lower the temperature, the patient was placed on strict “absolute rest” for a week or ten days as a preliminary measure. During this period he lay flat in bed with only one pillow. He was not allowed to read, to feed or wash himself, or to do anything for himself. Silence was imposed upon the sufferers from tuberculous laryngitis, and the intense dysphagia resulting from tuberculosis of the epiglottis, which, if unrelieved, would result in the patient dying from starvation on

account of the agonizing pain on swallowing, was mitigated to a certain degree by instructing him to suck milk through a glass tube from a glass placed by the bedside on the floor, the patient lying prone with his head hanging down over the side of the bed.

The cases of pulmonary tuberculosis which I was called upon to treat at Brompton at this time, and subsequently for many years, were much more severe and advanced than those that I have met with since the second World War. When I was a house physician there were often patients in the wards whose lungs were largely destroyed and replaced by cavities. I was reminded of the autopsy findings in the case of Keats: "On Sunday his body was opened; the lungs were completely gone, the doctors could not conceive how he had lived in the last two months."

The patients were often emaciated and suffered severely from exhausting night sweats. In the later stages they frequently developed intestinal tuberculosis with uncontrollable diarrhœa, or their organs were affected by amyloid changes resulting in albuminuria, œdema and diarrhœa. Hæmoptyses were common, at times severe, and sometimes fatal.

The risk of infection from the expectoration of tubercle bacilli, despite precautions taken in the collection and disposal of sputum, was very real, although the official view held at this time was that adults were not likely to contract tuberculosis from contact with "open" cases of pulmonary tuberculosis, and if a nurse or doctor did succumb to the disease, it was said to be due to reactivation of a previous infection. This was unfortunate as it led to carelessness on the part of nurses and doctors. No masks or gowns were worn when making beds, nursing the patient, or dusting the wards. Many times did I try to break the unwritten law which layed down that the Sister should stand on the side of the bed opposite to the doctor. The Sister would come to my side of the bed if I asked her to do so, but at the next bed she would resume her accustomed position. Eventually I grew tired of the unequal struggle, and in order to avoid the risk of infecting the Sister or nurse, I abstained from asking the patient to cough when I examined the chest. I sacrificed the completeness of my examination for the safety of the nurse.

I did not subscribe to the view then held, and now, after many years, the generally accepted opinion is that a patient who is suffering from active tuberculosis is a very real source of danger to those with whom he comes in contact, either in hospital, at home, or at his work.

As a house physician I was only concerned with the physical aspects of pulmonary tuberculosis. I was anxious to become expert in the diagnosis by means of clinical signs; I was interested in the course of the illness; in the effects of such methods of treatment as

were in vogue at the time, and in the morbid anatomy of the disease. I knew nothing, however, of the patient's thoughts about his illness, of how he was reacting to it, or in what way it was affecting his home life or his social relations; and, if I had been sufficiently in advance of my time to recognize the importance of their influences on the course of the disease, I should have had no opportunity of discussing them with the individual in a ward full of patients.

The senior physician, for whom I was working, for a time treated his patients with horse liver soup, and it was part of my duty to visit the hospital kitchen and cut up a horse's liver into small cubes from which the soup was made. This unpleasant beverage was kept in Winchester quart bottles in Sister's room, until she protested owing to the offensive odour, and after a few months the treatment was abandoned. Towards the end of my time as house physician at Brompton the artificial pneumothorax treatment was first used at the hospital. The apparatus was very complicated and was placed in charge of the resident medical officer, who alone was allowed to handle it. The value of artificial pneumothorax treatment was quickly recognized and it constituted one of the greatest advances in the treatment of pulmonary tuberculosis up to the time of the discovery of the antibiotics.

After being demobilized from the army in July 1919 I was appointed assistant physician to Brompton in the following October and continued to work there as a physician until the middle of 1953. During the years between the two world wars I continued to see many very advanced cases, both in hospital and private practice. Not all the patients with extensive disease appeared to be afflicted by a mortal illness. How often have I examined a beautiful woman looking in perfect health, but on placing my stethoscope upon her chest, the ominous signs of pulmonary excavation were clearly revealed,

“as in the sweetest bud
The eating canker dwells.”

The first thoracoplastic operation at Brompton was performed, I think, upon one of my patients in 1921. It was a horrible experience. All the ribs on the left side of the chest were excised under local anæsthesia in one operation, and the patient was dead within forty-eight hours. The surgeons have now realized the importance of a careful selection of cases for thoracoplasty, and the necessity of performing the operation in several stages, not removing more than two or three ribs at a time. Even now the pain and shock of the operation is often very distressing, and the amount of collapse of the lung produced by the best thoracoplasty is not so complete as with a good artificial pneumothorax.

In later years the surgeons introduced the operation of segmental or lobar resection, by which a diseased or cavitated area of lung may be removed. In this operation usually only a portion of one rib is removed, the patient is comparatively little disturbed, and in many cases an excellent result is obtained.

In a disease such as pulmonary tuberculosis in which the lesions are usually so widely disseminated through the lungs, it appeared to me probable that a cure would eventually be found in some chemical substance administered by mouth or by injection. Gold salts were used for this purpose for a few years from 1924 onwards and I kept careful records of a series of cases treated by gold, compared with a series of controls. In only one case did I see a really remarkable improvement follow the gold injections, but the risks of the development of deadly reactions, such as exfoliative dermatitis, agranulocytosis and purpura, were so great that the treatment has now been abandoned. About this time I tried the effects of inhalation of charcoal, being impressed by the fact that charcoal has the power of adsorbing tuberculin, and by the relative immunity of coal miners to pulmonary tuberculosis. I used Norit wood charcoal for this purpose, which has a relatively low ash content, but did not obtain sufficiently encouraging results to justify continuing the work. With the introduction of streptomycin, para-aminosalicylic acid and iso-nicotinic acid hydrazide very good results have been obtained in some cases, in others these drugs appear to have no effect. The extensive use of X-rays in the detection of early cases and the examination of contacts has undoubtedly resulted in many patients being treated by antibiotics when the disease is still early, and this probably accounts for the comparative infrequency with which pulmonary tuberculosis is seen now in the very advanced states. The general public is also more aware of the possibility of a cure and more willing to submit to the necessary X-ray examination.

When I was working at Brompton as a house physician the value of graduated exercises at a sanatorium had been recognized for a few years, and these were being carried out at the Frimley Sanatorium to which our patients were sent as soon as they were fit to be up six or eight hours a day. No longer were patients advised to take sea voyages to Australia, and we were now learning that tuberculosis could be as well treated in London as in the Swiss Alps. Neither was it thought necessary for the patient to winter abroad annually in order to remain cured. Keats, you will remember, went to Italy, only to die in Rome, and Stevenson to the French Riviera and later to the South Sea Islands. Stevenson in his paper "Ordered South" unclasps the book even of his secret soul when describing his life on the Riviera. Referring to the consumptive he writes: "It is in vain that

he spurs his discouraged spirit; in vain that he choseth out points of view, and stands there, looking with all his eyes, and waiting for some return of the pleasure that he remembers in other days, as the sick folks may have awaited the angel at the pool of Bethesda. . . . The world is disenchanted for him. He seems to himself to touch things with muffled hands, and to see them through a veil. . . . He cannot recognize how this phlegmatic and unimpressionable body with which he now goes burthened is the same that he knew heretofore so quick and delicate and alive. . . . the life of the invalid resembles a premature old age. . . . In this dulness of the senses there is a gentle preparation for the final insensibility of death. . . . day by day his strength decreases, and the circle of his activity grows ever narrower; and he feels, if he is thus to be tenderly weaned from the passion of life, thus gradually inducted into the slumber of death, that when at last the end comes, it will come quickly and fitly."

But it is not always so. Many patients do not pass insensibly into death as described by Sir Thomas Browne, when he wrote, "Tho' we could not have his Life, yet we missed not our desires in his soft Departure, which was scarce an Expiration; and his end was not unlike his Beginning, when the salient Point scarce affords a sensible Motion, and his Departure, so like unto Sleep, that he scarce needed the civil Ceremony of closing his Eyes; contrary unto the common way wherein Death draws up, Sleep let fall the Eye-lid."

How different from the death bed scene of Keats, as described by his devoted friend and nurse, Severn! "He remained quiet until the end, which made the death-summons more terrible. It happened about half-past four on the afternoon of Friday, the 23rd. He held my hand to the last, and he looked up at me until his eyes lost their speculation and dimmed in death. I could hear the phlegm boiling and tearing his chest. He gasped to me to lift him up, and in a short time died in my arms without effort and even with deadly rejoicing that it had come at last, that for which he so ardently longed for months. And I confess that his pallid dead face was for awhile to me a consolation, for I had seen it express such suffering. I had seen it waste away in that suffering, and I had seen that suffering long and in loneliness, and it was a happiness to think the poor fellow's misery was over."

“ These are they which came out of great tribulation.”

THE REVELATION

MUCH has been written on the subject of the influence of the mind on the body in a disease such as tuberculosis, but less attention has been paid to the reverse side of the picture, the reaction of the mind to the affection of the body. What are the patient's feelings when first told that he is suffering from pulmonary tuberculosis, what is his mental response to the various forms of treatment he is called upon to endure, and how does he react to the vicissitudes of the disease?

The doctor, whose unhappy duty it is to break the bad news, often seeks to soften the blow by lessening its violence. He may tell the patient there is a small “ patch ” in the lung which will require treatment in a hospital. In consequence some patients do not know that they are suffering from tuberculosis when they are admitted to hospital, and the shock when they discover—as they soon do—the real nature of their disease may have very distressing results. Patients fear treatment in special hospitals devoted to tuberculosis, or in sanatoria, because of the stigma attached to the disease. They do not wish their relatives, friends, or employers to know they are suffering from tuberculosis.

It is, however, the doctor's duty, and one which he must not shirk, to ensure that adequate treatment is given as early as possible, and the patient should be gradually prepared to accept the total, and usually prolonged upheaval of his mode of living which must inevitably occur. The difficulty is to steer a middle course between conveying the impression that the disease is not of a serious nature and will only mean absence from work for two or three months, and preparing the patient for the fact that he will require thorough and expert treatment for probably several years.

I have questioned a series of patients, who have undergone treatment for prolonged periods, and enquired what were their feelings when they were first made aware of the nature of their disease, and what were their reactions during treatment. The patients selected are some of those whom I have attended for several years, who were sufficiently intelligent to be able to put into words their mental reactions, and whom I have known very well. Further, they were all pleased to answer my questions and very interested in the enquiry. They were not selected for differences in the mode of onset, or for their clinical course, or on account of the special treatments adopted, but they do illustrate these varying facets of the disease.

There are many factors which enter into and modify the mental

reactions of the tuberculous, but of these I think the most important is the temperament of the patient, whether it be sanguine, choleric, phlegmatic or melancholic. Other points which require consideration are the age of the patient, the social and marital status, the financial position, and especially the method in which the patient is handled by the doctors. Complete reticence or apparent uncertainty on the part of the physician, as to the diagnosis or the correct treatment, is most disturbing for the patient and prevents him from achieving the mental and bodily rest which are essential for recovery.

I have arranged this series of patients according to their age when the tuberculosis was first diagnosed.

Martha. Aet 16. A schoolgirl.

I first saw Martha in March 1938. She was a pleasant, dark-haired, good-looking girl, with a pale complexion and sanguine temperament. Three weeks previously she had consulted her doctor on account of pain in the right side of the chest, cough, expectoration, and a temperature rising to 101° F. in the evenings. Examination of the sputum showed tubercle bacilli, and I found signs of pulmonary tuberculosis affecting the apex of each lung. The patient was treated by rest in bed in hospital for six months, followed by a stay at a sanatorium for eight months, when the X-ray film of the chest indicated that the infiltration in both lungs had "healed rather well." After this she remained at home for a time and then began work. I did not see Martha again until December 1948. She had been very well and early this year went for a trip to Australia. On stepping off a gangway on to a ship returning from Australia in June 1948 she twisted her right ankle. The ship's doctor applied a lotion and advised her to obtain an arch support on reaching London. The foot was still painful on her return home when the doctor she consulted prescribed an ointment and advised walking exercise. This caused more pain and swelling, and, in October, she went to a hospital where the foot was X-rayed and the bones were said to be normal. An orthopædic surgeon manipulated the foot under anæsthesia. This caused more pain and more swelling. In November the foot was manipulated again, twice without anæsthesia which caused excruciating pain, and the swelling increased. When I saw Martha in December the right foot was swollen on the dorsal surface, the skin was not red but the surface temperature was 6° F. hotter than at a corresponding point on the left foot. The sedimentation rate of the red cells was raised to 32 mm. per cent plasma at one hour. I arranged for a consultation with another orthopædic surgeon, and he diagnosed the condition as tuberculous arthritis, the X-rays now showing the lesion to be situated in the scapho-cuneiform joints and in the joint between the middle cuneiform and the 2nd and 3rd

metatarsals. The surgeon told me he would not be surprised if amputation were eventually necessary. The foot and leg were put in plaster and gradually the lesions healed, the plaster being removed after eighteen months. When I saw Martha again, in October 1950, there was full movement of the knee and ankle, she was wearing an elastic stocking and walking with the aid of two sticks. She was well and happy and in April 1953 was walking perfectly normally.

And this is Martha's account of her reactions to the illness:—

“When I went into hospital I did not know I had tuberculosis. I thought I just had pleurisy and would only be in hospital about three weeks. I soon discovered the truth from the other patients. Looking back now I think I would have preferred to know beforehand and to have been told by my doctor a little of what it would be like in hospital. My illness always occupied the main part of my thoughts, perhaps without my being conscious of it, that is why small things were quick to depress me. I remember we had a very sick patient moved into our ward, she used to moan at night. Within a day I had grown very frightened and depressed, imagining all sorts of things happening to her and to myself. After a few days you had her moved, and the relief was amazing. I think if she had stayed I would have made myself really ill. You said I was to be put into a ward with girls of my own age; this made so much difference. We had mutual interests and at times were quite happy and contented. The more outside interests we had the better, such as visitors to look forward to, and the wireless. The worst part of my illness was the uncertainty, not knowing how long I should be in bed. I remember thinking I would not mind how long it was, even two years, as long as I could say, ‘on such and such a date I will be cured.’ Even when I was progressing well I had a gnawing fear that I might get a setback. I really enjoyed my convalescence at the sanatorium because of the friendly atmosphere.

“Now my foot was a different story, because I was much older and I knew what a lengthy business tuberculosis is. This time I really was very upset and heartbroken, but I had a wonderful friend who stood by me and gave me something to live for. If one has something to live for it makes all the difference in the world.”

Ethel. Aet 18. At home.

In October 1933 I was first asked to see Ethel. She appeared to be of a phlegmatic temperament, and was noticeably offhand in her manner. She was unusually tall, just under 6 ft. For the last three months she had felt very tired and had lost over a stone in weight. Two weeks before I saw her she was found to have a raised temperature and the sputum contained tubercle bacilli. I arranged for her admission to hospital, where an X-ray film showed infiltration and excavation

in the right upper zone, infiltration in the right mid zone and in all zones of the left lung. With rest in bed and a course of Sanocrysin injections she made very good progress, and, in January 1934, was transferred to a sanatorium where she remained for five months. On leaving she was afebrile, with no cough or sputum, there was a considerable improvement in the X-ray appearances, the sedimentation rate was normal and she was walking four or five miles a day. I saw Ethel again in December 1934; following a cold she had not felt so well and the sputum now contained tubercle bacilli. I arranged for her admission to hospital again where she was given a second course of Sanocrysin and, after five months, she went home much improved. Subsequently I examined her at frequent intervals during the next six years, and in 1941 she began secretarial work. The X-ray films showed progressive hardening and calcification of the lesions in both lungs. In June 1946 Ethel married and became pregnant at the end of the year. The pregnancy was terminated in February 1947 as the lesion in the left upper zone was not soundly healed, but in 1953 she again became pregnant and is expecting her baby in June 1954.

Here we have a young girl who was affected with very extensive bilateral pulmonary tuberculosis, with excavation. The treatment, which was given in the pre-antibiotic age, proved entirely satisfactory, and she was subsequently able to live a normal life.

The following is the account of her reactions to the illness:—

“When I was first told I had tuberculosis I felt pretty terrible, as I suppose subconsciously I had dreaded it for years, as nearly all the girls on my father’s side of the family had died of it. I felt trapped with no escape. When I first went into the nursing home I read one of Warwick Deeping’s books which was all about a tuberculous colony. This depressed me more than ever, as I could not imagine myself leading a normal life again, but thought I should have to spend the rest of my life with other people with the same complaint.

“I think one of the most depressing times is when one enters hospital and other patients come in and ask you if you are going to have this or that done. You naturally imagine yourself as bad as the worst of them. Nevertheless I think you helped me a lot by explaining what was happening when I had the injections, etc.”

Wanda. Aet 18. Single. Student of Economics.

I first saw Wanda in hospital in October 1949. She was of slender build, about 5 ft. 2 in. tall, with an oval pale face, dark eyes and thick, long black hair coming down below her shoulders. She was a Central European refugee with a sanguine temperament, a thoughtful, contemplative girl, and interested in psychology.

In May 1949 Wanda suffered from a feverish attack with a cough, from which she rapidly recovered. In July and August there was a recurrence of the cough for a few days, and in September an X-ray film of the chest showed tuberculous infiltration throughout the whole of the right lung, with a cavity in the mid zone. Infiltration was also present in the upper and middle zones of the left lung, with a cavity in the left mid zone. The sputum contained tubercle bacilli and the sedimentation rate was raised to 50 mm./1 hour (Westergren). Despite this gloomy picture Wanda did very well. Treatment in hospital consisted of rest in bed, injections of streptomycin, the administration of P.A.S. by mouth, and the right phrenic nerve was crushed. She went to a sanatorium after six months in hospital, when up three hours a day, the sputum now showing no tubercle bacilli in direct films or on culture. Three months later she left the sanatorium, with a normal sedimentation rate, and no cough or sputum. The X-ray film showed now no evidence of cavitation, and the shadows of the infiltration had cleared in a remarkable manner.

I have seen Wanda at regular intervals since she left the sanatorium at the end of June 1950. She continued her studies and passed her examinations in economics. When I last examined her in March 1954, the X-ray film only showed a few small, hard shadows in both upper zones. Wanda was engaged to a student when I first met her, and she is now hoping very shortly to be married.

To my enquiries she replied, "When my tuberculosis was first diagnosed it came as a terrible shock, it was the last thing I expected. My family was even more worried than I was and this had a very depressing effect. I was terribly worried about my fiancé, thinking he might have caught it from me. I knew of a few cases of chronic tuberculosis, but had never met anyone who had successfully recovered. The picture I had in my mind was not a pleasant one. During my first few days in hospital I tried to find out all I could about the state of my lungs, and, as soon as I did that, my tuberculosis no longer worried me and I was deeply convinced that I should soon be well again. I was glad I was suffering from tuberculosis which I thought could be cured, and not from cancer or some other disease which would leave a permanent deformity. I was always afraid I should have to have an artificial pneumothorax or a pneumoperitoneum, as I am always afraid of any kind of treatment. While I was on streptomycin and P.A.S. I had very deep confidence in their effectiveness. My recovery was also aided, I think, by the fact that I had complete confidence in you because I could see that you were interested not only in my weight, but also in the way my mind worked, and you often asked me what I wanted to do in the future. You always knew how to cheer me up and, when you started telling me all your subconscious dreams, I used to forget

all about my tuberculosis. On the whole I never doubted I would be cured and could then lead a normal life, which I do now."

Guy. Aet 18. Student, surveying.

I was asked to see Guy early in October 1939. I had previously seen his sister who was suffering from pulmonary tuberculosis. Guy was a slim, fair-haired youth, of a phlegmatic and equable temperament. His chest had been examined from time to time during the past eighteen months, owing to his sister's illness, and nothing had been found wrong. Ten weeks before I saw him he developed a cough and went away for a holiday. The cough persisted, accompanied by sputum, and examination of the sputum showed the presence of tubercle bacilli. When I examined him I noted the typical odour of phthisis, and signs were present at the apex of each lung. Guy was admitted to hospital in a few days. The X-ray film showed extensive infiltration throughout the left lung, with a cavity in the upper zone, and a small area of infiltration in the right mid-zone. A left artificial pneumothorax was established, with a good collapse of the lung, and after six weeks Guy went to a sanatorium. He did very well there and returned home six months later, having weekly refills. He gained 12 lb. in weight at the sanatorium and lost his cough and sputum. Three months later he resumed his course of studies and in due course qualified as a surveyor. He married in 1947 and the artificial pneumothorax was discontinued in January 1951, after ten years. During the last year or so the refills were only given every six weeks. I saw him regularly during these years; the final X-ray film in April 1953 showed numerous calcified lesions throughout the right lung. The left lung had expanded with a cap of thickened pleura, and there was a calcified lesion in the left upper zone. Guy is now engaged actively in his profession.

He expressed his feelings as follows: "I did not worry about the development of the tuberculosis nor about the treatment. I am not a worrier. It came at a fortunate time in my career, just after I left school. I have not had to change my life on account of the disease. After I returned from the sanatorium I was in the air-raid shelter of a house which received a direct hit in an air-raid, but it did not affect my chest. If something is inevitable I accept it, but if there is something that I can do I may worry."

George. Aet 20. Builders' contractor.

This is the sad story of a prolonged illness, rendered more distressing by many operations, but with, I hope, a happy ending. Until the age of seventeen years George was in good health, he then scratched his leg with a nail in a running shoe and developed acute osteomyelitis of the tibia. This was followed by an empyema on the right side. After

several bone operations and a rib resection for drainage of the empyema, eventually a partial thoracoplasty was performed in which the posterior portions of the seventh, eighth and ninth ribs were removed in order to close the empyema space. Shortly afterwards the glands in the right axilla enlarged and broke down, discharging purulent material, and the retro-sternal glands were also affected, the pus working its way to the surface through a sinus opening in the neck just above the manubrium sterni. Tubercle bacilli were found in the pus, and after many months spent in a surgical tuberculosis hospital, with several operations for scraping and draining the sinuses, George went to convalesce in Austria and Switzerland.

He now remained fairly well for two years, until the end of 1933, when the glands in the right axilla again broke down and were drained. The thoracoplastic scar also weakened and pus was discharged from the back of the chest below the angle of the scapula. Periodically a subcutaneous fluctuating swelling would form, and eventually, by pressure over the abscess, the pus could be evacuated through the sinus opening. After some months another surgeon was consulted who considered there was an intrapleural collection of pus and a further drainage operation was performed. Up to this time George believed that he was suffering from surgical tuberculosis and was staggered when the surgeon, after looking at the X-ray film of his chest, told him that he had also pulmonary tuberculosis. This horrified George as he feared the stigma which is attached to the disease, and was dismayed at the thought he might infect others. It was at this time, in 1935, that I was first consulted, shortly after his engagement, and I did not doubt that the film showed evidence of a tuberculous lesion at the apex of the left lung, probably of some standing. The pus was still periodically discharging from the thoracoplastic sinus, and George returned once more to the surgical hospital where further scrapings of the sinus were made. George was married in 1938 and I did not see him again until 1942. During this time he had coughed up blood on two occasions, had suffered two attacks of jaundice, and had undergone an operation for ischio-rectal abscess. On coming round from the anæsthetic he had his third hæmoptysis. The sinus in the back of the chest continued to discharge pus from time to time, but despite this he kept at work, wearing a dressing over his chest. The pus, when aspirated, was found to contain tubercle bacilli.

When I took an X-ray film of the chest in 1943 there was evidence of spread of the tuberculosis to the right lung, fine mottling being seen in the upper zone of each lung. Eventually, towards the end of 1945, the chest sinus closed, but the lesion in the right lung slowly progressed, and in 1946 a cavity formed in the apex of the right lung. George, however, kept at work, although the cavity remained unclosed

and fibrotic changes occurred in the right upper lobe. During 1948 George seemed very well and at my next examination early in 1949 the film of the chest showed the trachea displaced to the right, and a honey-comb appearance in the right upper lobe, due to the formation of bronchiectatic cavities. In 1950 George had several attacks of abdominal pain, accompanied by the passing of bright red urine, and chemical examination showed the presence of porphyrins in the urine. Subsequently there was evidence of increased activity in the right lung, the sputum contained tubercle bacilli in large numbers, and the sedimentation rate of the red cells rose to 42 mm. per cent plasma/one hour. George was now kept in bed and given a course of streptomycin and P.A.S., and after four months' treatment there was considerable improvement, with 12 lb. increase in weight, and a fall of the sedimentation rate of the red cells to 5 mm./one hour.

Despite these favourable features the sputum still contained large numbers of tubercle bacilli in the spring of 1951, and tomograms showed three circular cavities in the right upper lobe, in addition to the bronchiectatic spaces. The lesion in the left upper lobe had healed by calcification. On reviewing this prolonged and gloomy story and considering that there were now three young children at home, I felt there was only one course I could advise, but I knew this would not be welcome. Now that the active disease was apparently localized to the right upper lobe, and, in view of the cavitation and the constant presence of tubercle bacilli in the sputum, I did not hesitate to advise that the upper part of the right lung should be collapsed once and for all, by an upper thoracoplastic operation. This course offered the hope of restoration to good health.

I pointed out that it was impossible to close the cavities either by prolonged rest or by the use of antibiotics. I spoke of the risk of further hæmorrhages or of the infected sputum spreading the disease elsewhere, I stressed the significance of the fact that the apex of the left lung had healed by calcification, which indicated good recuperative powers, and, finally, I reminded him of the thought in Julius Cæsar:

“ There is a tide in the affairs of men,
Which, taken at the flood leads on to fortune;
Omitted, all the voyage of their life
Is bound in shallows and in miseries.
On such a full sea are we now afloat,
And we must take the current when it serves,
Or lose our ventures.”

George was naturally very averse to my counsel as he had undergone so many operations with so little success, and he would not make up his mind to agree. However, two months later, what I had foretold

took place, after lifting a heavy box there was another, and a more severe, hæmoptysis followed by high fever, and this decided him to take my advice and to submit himself once more to operation.

The thoracoplasty was performed in June 1951, the six right upper ribs being removed in a one-stage operation under general anæsthesia, with most satisfactory results. After a prolonged period of convalescence, lasting for seven months, George returned to work and has continued in good health since then. He now looks and feels very fit and, I trust, will have no further relapses.

During 1949 he had another worry. This time it was ill-health in two of his children and I was asked to see his three sons. The eldest appeared in perfect health, and the Mantoux test was negative, indicating that he was not affected by tuberculosis. The Mantoux test on the second boy had been negative in 1948, but in the early part of 1949 he had an acute febrile illness and the X-ray film of his chest showed evidence of epituberculosis. There was probably an enlarged tuberculous gland in the chest compressing a bronchus, and the Mantoux test was now positive both to human and bovine preparations. It was thought possible that the boy had been infected by eating cream while on holiday during the previous summer. The youngest child also developed signs of epituberculosis, with a positive Mantoux reaction, but both children made good recoveries and are now well. The youngest child also passed red urine from time to time, containing porphyrins.

George had the inestimable good fortune to marry a devoted and understanding wife who nursed him assiduously when he was ill and who supported him in all his afflictions. His temperament was sanguine and he remained cheerful even during his time of great tribulation, and this is how he reacted to the illness:—

“ I resented not being told that my lungs were affected. I like to know what I have to battle with, and how long approximately I must make my plans for being ill. If you do not know this your mind is centred on your illness, and not on other things. I was so sensitive about my illness, I thought it was a disgrace and I tried to disguise it. There is a tremendous difference between surgical and lung tuberculosis, because of the risk of infecting others. Even when I had the first hæmoptysis I was not told I had pulmonary tuberculosis, the doctor said the bleeding had come from a vein in my throat. The worst parts of the illness were the repeated operations and the uncertainty of another major operation. Even after my scapula had been lifted and scraped, the sinuses continued to discharge. When I knew my lung was infected it was dreadful having to decide whether I should remain at home, and whether I should see my children. I felt obliged to keep to myself and see no one except my immediate family circle. The more you understand this disease the better you can cope with it. When I came to you,

you cheered me up enormously, because you told me my lung had been infected for years. The last thoracoplastic operation did not upset me because I had one hundred per cent confidence in the surgeon and doctors. I have not always felt this. Explanations tend to remove fears, and I have always been very sensitive to my relatives' reactions to bad news about myself. Too much sympathy upsets me and I always felt grateful to you for your practical approach to my illness. The prolonged illness has not interfered very much with my business life, but it has interfered enormously with my married life and with my social relations."

Sophie. Aet 20. Single. A book-keeper.

Sophie's father died of pulmonary tuberculosis in 1942 and her chest had been X-rayed periodically since then, until, in May 1948, a shadow was seen in the right lung. She was examined by the tuberculosis officer in May and July and told to stop work, but the sputum was not tested for tubercle bacilli. I was asked to see Sophie in October 1948.

She was a delicate, good-looking girl, with blue eyes, very regular features and fair hair, calm and phlegmatic in temperament. Five feet eight inches in height and weighing 9 st., she had lost about one and a half stones in the last year. X-ray examination showed infiltration in the upper zone of the right lung, with a cavity at the apex of the right lower lobe; at the left apex there were a few small shadows. I arranged for immediate admission to hospital, and a right artificial pneumothorax was established. A month later adhesions were divided, but although a good collapse of the lung was now obtained, the cavity did not close. A cavity at the apex of the lower lobe is usually very difficult to close by any form of collapse therapy, and so it proved in this case. Eventually, by keeping the foot of the bed raised 10 in., and by "concertina-ing" the lung by alternatively allowing it to expand and then collapsing it again by inserting air into the pneumothorax, the cavity did close. Sophie was ten months in hospital before she was fit to be transferred to a sanatorium. After four months there she came home with a normal sedimentation rate, no cough, no sputum and feeling very well.

I saw Sophie periodically after her return, and from time to time refilled the pneumothorax. She was a very good patient, very placid, and she hardly ever volunteered any remarks. In September 1951 she married, and in May 1952, while in church, had a spontaneous pneumothorax on the left side, with severe dyspnœa. I saw her the next day, when I found signs of mediastinal emphysema with a very small left apical pneumothorax. In June 1952 there was a recurrence of the spontaneous pneumothorax on the left side, and so, in July, I advised

that the right artificial pneumothorax should be abandoned, after being in action for nearly four years. Later in the year Sophie became pregnant, and in May 1953 a healthy baby was born. When I last saw her in March 1954 she was very well; the X-ray film of the chest showed calcified foci in the right mid-zone and the left apex.

Sophie, in answer to my questions, wrote: "My father died of pulmonary tuberculosis and I presumably caught it from him. It came as an awful shock to me but I soon became resigned. The worst part of the treatment was the anxiety as to whether the cavity was going to close with the pneumothorax. It has not interfered much with my life, and I have now practically forgotten about it. Physically I felt much better when the pneumothorax was discontinued. I was always tired when the lung was collapsed."

Ronald. Aet 22. Assistant in Surveyor's Office.

In August 1949 Ronald was taken ill with what was thought to be pneumonia of the right lower lobe. He was admitted to hospital under my care, when many râles were heard scattered through the right lower lobe. The breath sounds were weak, and there were no signs of pulmonary consolidation. Tubercle bacilli were found in the sputum, and the X-ray film showed widely scattered areas of infiltration in the upper and middle zones of both lungs but not in the right lower lobe where the physical signs were most marked. Tomograms revealed no evidence of cavitation. The sedimentation rate of the red cells was increased to 44 mm. plasma/1 hr. (Westergren), and the temperature was rising to 101° F. in the evenings. Ronald was a tall, well-built young man, with dark hair and a sallow complexion. His manner was somewhat brusque and temperament melancholic. He continually asked how long he would be in hospital, and how long he would be away from his work. His anxiety was increased by the fact that he was engaged to be married. He was treated with rest in bed, and with daily intramuscular injections of 1 G. streptomycin, together with P.A.S. The streptomycin was continued for 70 days, and the P.A.S. for two weeks longer. By this time the temperature had fallen to normal and the sedimentation rate of the red cells to 3 mm. plasma/1 hr. He was then transferred to a sanatorium where he stayed for four months. No signs of activity were found during the sanatorium course and on discharge he was walking two miles a day.

On return to London Ronald was overpowered by the summer heat, he sweated, his nerves were upset, and he feared a relapse. I next saw him in August 1950, when he felt "grand." A few râles were audible after cough at the right apex, and the X-ray film showed soft shadows at the right apex, with calcifying lesions in both upper zones. Ronald was married in September 1950 and returned to part-time

work the next month. During 1951 the lesions showed progressive hardening, the sedimentation rate remained at 1 mm./hr., and at the end of the year he was doing full-time work. During 1952 the X-ray film showed extensive spots of calcification in the upper half of the right lung and the upper two-thirds of the left lung. In May 1953 he passed his final surveyor's examination.

Ronald reported his reactions to the illness as follows: "I was first told that I was tuberculous after I had been in bed in hospital for two weeks. I did not worry a great deal to begin with, and soon adjusted myself to a long stay in bed. The worst part of the treatment was the worry during the last few weeks at the sanatorium whether I should pass the final test. My examination for a surveyor was put back three years and I lost some promotion."

Albert. Aet 24. Dental surgeon.

When I first saw Albert in the spring of 1935 he was in his third year as a medical student, having qualified three weeks previously as a dentist.

There was no doubt that he was suffering from pulmonary tuberculosis, but I found nothing to indicate that he would not improve as well as the cases I have described above, and nothing to suggest that this was the beginning of an illness which was to last for many years, and which was to be marked by periods of improvement, by relapses and by complications, until, after many tribulations, the final tragedy occurred.

Albert was a spare sandy-haired young man with a pink and white complexion and clear-cut features. He was of frail physique with a poorly formed chest; nearly 6 ft. in height, he walked with a slight stoop. Throughout his illness he displayed a melancholic temperament, and was intensely apprehensive of the future rather than of the present.

Just before taking the final dental examination Albert ran a temperature for three days, with a slight cough and expectoration, and fleeting pains in the chest on the right side. When I examined him I found slight signs at the apex of the right lung, and an X-ray film revealed shadows suggestive of tuberculous infiltration in both upper lobes. He was unwilling to come into hospital, and so went away for a month to the seaside where he rapidly regained strength, lost his cough, put on a little weight, and was afebrile. After four weeks he returned home, and continued to rest, but in August he was again taken ill with abdominal pains, cough, expectoration and fever, and in a week or so developed a left-sided pleural effusion. The sputum was tested and tubercle bacilli were present. Two months later he was admitted to hospital under my care. I kept him in bed for a further

two months, when the pleural effusion subsided, and early in the next year he was transferred to a sanatorium.

Albert left the sanatorium in the summer of 1936, with a very good report, the superintendent writing: "I have allowed him to leave earlier than I would otherwise have done because he is such a good early case and because he is extremely sensible and can carry on his treatment at home."

I examined Albert again towards the end of the year, when the X-ray film showed scattered infiltration in the upper zone of both lungs, the shadows being fairly hard, with basal pleural adhesions on the left side. He now reported that he felt better than he had done for five or six years and was also heavier.

He gave up the idea of qualifying as a doctor and in the spring of 1937 began part-time work as a dental surgeon. I hoped that he was now over his troubles. The X-ray film showed considerable clearing of the apical shadows and the sedimentation rate of the red cells was normal.

At the beginning of the second world war Albert applied for a dental commission, but was rejected on medical grounds. This caused him considerable anxiety and he asked me to examine him again. Although he looked and felt well, and although the apical shadows as seen on the X-ray film were harder, I heard râles at the apex of the right lung and the sedimentation rate of the red cells was raised to 30 mm. per cent plasma/1 hour. I advised him to take his evening temperature and keep a weekly record of his weight, but I heard nothing further until the end of 1943, and during these years he was doing full-time work and had married. In December he developed a sore throat which would not improve and eventually he consulted a throat specialist who found the left tonsil covered with a white exudate and biopsy showed the condition to be one of tuberculosis of the tonsil. I found a general deterioration, he looked thin and ill, the X-ray film showed a diffuse fine mottling of the middle zone of both lungs, the sedimentation rate of the red cells had risen to 40 mm. per cent plasma/1 hour and the temperature was raised. Albert was at once admitted to hospital. In view of the extensive active bilateral pulmonary tuberculosis it was not considered advisable to give X-ray treatment to the tonsil, but, with rest in bed alone, for it was before the days of antibiotics, he made a wonderful recovery, the tonsil rapidly healing, the fine mottling disappearing from the middle zone of the lungs, and the temperature falling to normal. He continued to remain in bed and a few months later went to Scotland.

Albert now expressed no desire to get up, and in order to begin the task of putting him on his feet again, he was admitted to a sanatorium, where he stayed until the middle of 1945. The superintendent then

wrote to me saying, "Considering his condition originally he has made a phenomenal recovery." The X-ray film of the chest, however, was not very satisfactory. Much fibrosis had taken place in the right upper lobe, pulling the trachea sharply to the right. There were also fibrotic changes in the left upper lobe, and translucent areas suggesting small bronchiectatic cavities in both upper lobes, but there was no evidence of calcification. The sputum, which was very scanty, contained a few tubercle bacilli. He was, nevertheless, told that he was fit to resume work as a dentist.

I examined Albert on his return to London in the autumn of 1945 when he looked well and quite plump. The sedimentation rate of the red cells was 12 mm. per cent plasma/1 hour, and coarse râles could be heard over the apices of both lungs. He resumed part-time work as a dentist, and, from now onwards, had what he called "toxic" attacks in which he suffered from malaise and sometimes ran a slight temperature. During the whole of 1947 and the first half of 1948 he continued in comparatively good health, I examined him three or four times each year, the X-ray film of the chest showed no change and the sedimentation rate of the red cells was usually about 10 mm. per cent plasma/1 hour.

Albert was always very depressed and apprehensive of what I should find for about a week before he visited me, but always went away cheerful and encouraged, and remained so for two or three months until his next visit was due. In the autumn of 1948 Albert noticed a painful swelling on the dorsum of the right foot. He consulted a surgeon who removed the extensor tendon and sheath of the right big toe as it was affected with tuberculosis. Despite this evidence of further dissemination of the infection, the patient quickly regained his health, maintained his weight, and continued working for another eighteen months. In the summer of 1950 a further complication occurred, this time a tuberculous infection of the right epididymis, with a rise in the sedimentation rate of the red cells to 30 mm. per cent plasma/1 hour. The epididymis was removed and a course of streptomycin given, and he made a very good recovery and soon returned to work.

Two days after Christmas, Albert coughed up a little blood for the first time, but there was no evidence clinically of fresh activity and the sedimentation rate of the red cells was only 6 mm. per cent plasma/1 hour. He continued very well, carrying on his practice during 1951 and 1952, but in September of 1952, while on holiday, he twice coughed up a little blood during the night. I considered that the bleeding had come from one of the small bronchiectatic cavities.

The next month Albert came to see me again. He was not so well, the sedimentation rate of the red cells had risen to 36 mm. per cent

plasma/1 hour, and he complained that his chest was tight. There was no change in the X-ray findings and no loss of weight. I ordered now a course of iso-nicotinic acid hydrazide tablets which he took for three months. About this time, and against my advice, he adopted a baby aged fourteen weeks. I was opposed to this because I thought there was a grave risk of infecting the infant, and also because I thought Albert's health was in a very precarious state and that his expectation of life was considerably reduced.

During 1953, until the summer, all seemed to be going well, and the last time I examined Albert was in August of this year. He told me that he was becoming progressively more short of breath, and had to pause after walking up a slight slope. I was very disturbed to find the sedimentation rate of the red cells raised to 40 mm. per cent plasma/1 hour, although the patient's weight had not fallen and the X-ray film showed no change. I advised a second course of iso-nicotinic acid hydrazide.

In September 1953 Albert tried to insure his life to provide for the education of the baby, but was rejected.

About this time Albert told me how he had reacted to his illness. He said: "It was not a shock to me when I was told I had tuberculosis. I had been overworking as a medical student, and helping in the tuberculosis clinic. I realized that probably I should not be able to qualify as a doctor. The worry of this disease results from the fear of being put out of commission and wondering whether one will have the money to carry on. One of the greatest difficulties is to forget about it and not allow one's apprehension to run riot."

Referring to his medical examination for a dental commission he said: "When the army doctors surveyed my puny body in its stark nakedness, and shook their heads in a very wise way I began to wonder what other ghastly disease I might have."

The final scene came very suddenly on the night of December 4th. I had been in bed for a short time when my telephone rang and, with a very agitated voice, the local doctor told me that he was speaking from the dentist's house, to which he had been urgently called, to find our patient dead from a profuse hæmoptysis.

Later I heard the details of the final scene. Albert had been feeling particularly well that day, and although life was always a battle, he had lately been having more confidence in himself and in the future. On this fatal evening his wife went up to bed, and shortly after heard her husband coughing downstairs. He walked upstairs and came into the bedroom, quite calmly. She turned to say something to him, when he put up his finger, said nothing and walked quickly out into the lavatory. She then heard a violent noise as if he were coughing and being sick. She rushed in and found he had coughed up a tremen-

dous amount of blood into the lavatory pan, several pints. He started to speak but could not finish, and his wife told him to go back to bed and lie down while she fetched a basin. She ran downstairs and on returning found him lying on the bed, unconscious, with obstructed breathing, his mouth was full of blood, and in a minute or so more he was dead.

I think the final hæmoptysis must have come from a larger cavity, deeper down in the lung, which was not shown in the X-ray films. The healing, which had taken place during all these years had always been by pulmonary fibrosis and not by calcification, from which we may deduce that in tuberculosis it is better for the lungs to calcify than to fibrose.

I pay my tribute to a very gallant gentleman, highly skilled in his craft, who for years fought against desperate odds, and who was supported in all his reverses by the constant care and encouragement of his devoted wife.

Dora. Aet 25. Secretary.

Dora had frequent colds during the winter of 1947 and they continued throughout the following summer. In the autumn of 1948 she was seen by a chest specialist, and an X-ray film revealed a thick-walled cavity at the apex of the lower lobe of the right lung, with calcified lesions in the left middle and lower zones. The sputum was examined and tubercle bacilli were found to be present.

On hearing this bad news the general practitioner asked me to see her. Dora was a good-looking, well dressed blonde of phlegmatic temperament, and, as I subsequently found, a remarkably easy patient to treat. We arranged for her admission to hospital and immediately established an artificial pneumothorax on the right side when the cavity, despite its thick walls and unfavourable situation, closed satisfactorily.

After five weeks in hospital Dora returned home and came to me subsequently for refills. In September 1957 a spontaneous pneumothorax occurred on the side of the artificial pneumothorax, but this produced no ill effects and saved her from one refill. At one of her visits I noticed a very handsome ring on the fourth finger of her left hand, and when I commented on it she told me that she hoped to be married in a few months.

A few weeks later I was interested to read of a court case in which a girl was being sued on a judgment summons. The plaintiff's counsel asked her to take the glove off her left hand. He then remarked on a large ring shining on her engagement finger and suggested it was worth several hundreds of pounds. "Have you thought of selling your ring to pay this debt?" said the counsel. "Certainly not,"

replied the girl, and the Judge intervened, "I am not going to make a girl sell her engagement ring." The girl was my patient.

Dora was married in May 1952 and I discontinued the artificial pneumothorax at the end of 1953 after keeping the lung collapsed for five years. The lung was fully expanded within four months of discontinuing the artificial pneumothorax, and during the whole illness there were no set-backs and no prolonged period of treatment in bed. Further, no antibiotics were used. Dora was not a "career girl" and did not mind giving up her work. She took her treatment very philosophically.

And this is how she felt: "I was not upset when I learned I had tuberculosis. It did not seem possible. If I had been told at the onset that the artificial pneumothorax would be continued for five years I should have felt very bad. The worst part of the treatment was that it stopped me from doing things, especially dancing. The seriousness of it never sank in."

Carol. Aet 22. Furrier.

I saw this young man in consultation with his general practitioner at the beginning of his illness in the summer of 1939. Five days previously he had been taken ill with a sore throat, but in a day or so this improved. Signs of bronchitis then rapidly developed, with cough, expectoration, tightness across the chest, pain on the left side of the chest in front on coughing or deep breathing, and the temperature was raised to 102° F. in the evening. When I examined him in the late evening he had been drowsy all day, the temperature was still 102° F., and I found abnormal signs in the chest, localized to the lower lobe of the left lung. The breath sounds here were weak, with sharp râles, but there was no increased voice conduction. The condition suggested an early bronchopneumonia, with considerable toxæmia.

The patient was moved into hospital and the temperature remained raised, to between 101° and 102° F., for a week, when it fell to normal by lysis. The sputum now contained clots of blood and tubercle bacilli were present. An X-ray film of the lungs showed scattered infiltration in the upper half of the left lung, with, probably, a caseating lesion in the left lower lobe, and pleural thickening at the left base. The right lung appeared to be normal. After remaining in bed for a few weeks with a normal temperature, the patient was allowed to get up by graduated stages, and, later in the autumn, went to a sanatorium in Switzerland. In the following December a left artificial pneumothorax was induced, and this was followed by adhesion section. A good collapse of the lung was obtained and the patient returned to England in May 1940. I continued the pneumothorax refills until December 1951. By now only the apex of the lung was collapsed,

the lower portion, which contained the main lesion, having expanded spontaneously. The pneumothorax had been maintained for twelve years, the refills during the latter years being given every four weeks.

The patient responded very well to the treatment, and went back to work in June 1940. In March 1941 he began playing tennis again, a game at which he was very expert, and in 1941 he resumed swimming. By 1949 he was playing first class tennis, and was not appreciably handicapped by the artificial pneumothorax.

Carol was a big, heavily built man, with a tendency to kyphosis. Just over 6 ft. in height and weighing nearly 16 st., his chest wall was so thick that I required a specially long needle for the refills. His hair was black and rather coarse, his complexion sallow and his eyes were dark and limpid. I found him an ideal patient, with a calm, yet sanguine, temperament, and one of nature's gentlemen.

Our patient woke one morning at the end of August to find his vision blurred, both eyes being affected so that he could not read the paper. When seen two weeks later he had been troubled by a frontal headache for a few days, and the vision was slightly worse. He did not complain of further visual symptoms, such as flashes of light.

I arranged for a consultation with an ophthalmologist who found the fundi and pupil reactions normal. Examining the fields of vision with a small test object the patient was found to have a completely blind area (scotoma) at the fixation point and to the right. On charting this scotoma on a perimeter it was localized in the right lower quadrant of the field. It was complete (absolute) for about 10° from the fixation point, and became less complete (partial) as it was traced outwards to about the 30° circle. The rest of the fields was unaffected.

These findings localized the lesion to the visual pathway, on the left side of the brain, somewhere between the chiasma and the visual cortex, and the fact that the scotoma was in the lower quadrant limited it to fibres running to the visual area in the roof of the calcarine fissure near the posterior end. The fact that the blind area reached the fixation point, while in vascular lesions affecting the cortex the macular area is usually spared, and the absence of any symptoms such as flashes of light which are caused by irritation of the cortical cells, still more accurately localized the trouble to the optic radiations, somewhere between the internal capsule and the calcarine fissure. Thus the lesion might be situated in the calcarine fissure, where the macular fibres form a wedge between the fibres from the upper and lower peripheral quadrants of the retina, or it might be farther forward in the temporal lobe where the fibres of the optic radiation splay out to form Meyer's loop, arching over the descending horn of the lateral ventricle.

The reason why the macula is usually spared in cortical lesions

causing hemianopia is not definitely known. Probably the macular cortical area extends further forwards than does the cortical area of the peripheral retinal zones. Further, the macular area has a double arterial blood supply, anastomotic branches from the middle cerebral artery in addition to the calcarine branches of the posterior cerebral artery. The latter is the sole supply of the cortical area for the periphery of the retina.

The patient was admitted to hospital for investigation. The electro-encephalogram, the cerebro-spinal fluid, the blood count, the sedimentation rate of the red cells and the X-ray films of the skull showed no abnormalities. The blood Wassermann reaction was negative. In a few weeks, vision was much improved and within three months Carol was once more playing first class tennis. This emphasizes the importance of withholding a definitely bad prognosis at the onset of vascular lesions involving the visual tract. The sudden onset of the blindness strongly favoured a vascular lesion, as did the almost complete recovery after three months. In the eye small arteriolar blocks usually lead to permanent localized blind areas, while thromboses of the smaller branches of the retinal vein, which can be seen with the ophthalmoscope, usually recover almost completely in young people, when they are likely to be due to a mild infection rather than to arteriosclerosis. The diagnosis of thrombosis of a small vein in the brain substance affecting fibres of the optic radiation in the left hemisphere is also favoured by the finding of a normal electro-encephalogram.

There is a further point of interest in this case. The onset of pulmonary tuberculosis with signs of an acute bronchopneumonic process and severe toxæmia was most alarming, and yet, after only a few weeks' rest in bed the acute phase of the disease passed and the temperature fell to normal.

And how did Carol react to his illness? These are his words: "When I was first told that I had tuberculosis, I thought that all who contracted the disease had it equally severely, and that it was largely a matter of mountain air and a strong constitution that would cure it in every case. When I arrived at the sanatorium in Switzerland I was very soon brought to earth and I realized for the first time what my illness really meant, and I hated everyone for telling me about it. I was now a member of the great family of the tuberculous and not allowed to forget it. I hated myself for having it. I continued to worry as I was informed my cavity was not getting any smaller, and when I was told I was to have a pneumothorax I felt stimulated that something was to be done. In common with all the other patients I felt I was a kind of guinea-pig, and that I should never be able to play any kind of sport again, and I was prepared to do anything as long as I could

eventually get back to civilization. My adhesions were eventually divided and I made a complete recovery.”

Yvonne. Aet 25. Joint Proprietor and Manageress of a ladies' blouse and neckware factory.

Yvonne had not been well since November 1935, when she suffered from a series of winter coughs and colds. At the beginning of February 1936 she coughed up about two tablespoonfuls of blood in the evening, and the next night about the same amount. The sputum remained blood-stained for three or four days, but a sputum test showed no tubercle bacilli. I was asked to examine this lady at the end of February, when I found extensive signs of tuberculosis in the left lung. On X-ray examination there was infiltration in the upper and middle zones of the left lung, with cavitation in the middle zone. The upper zone of the right lung was a little suspicious of infiltration.

Yvonne had been married for nearly four years, but there were no children of the marriage. She was about 5 ft. 5 in. in height, with dark hair, small features, retroussé nose, and a pink and white complexion. She was cheerful and sanguine in temperament.

After three months' treatment in hospital, first with absolute rest, and then with two or three injections of Sanocrysin, the patient was transferred to a sanatorium. The Sanocrysin had been discontinued owing to the appearance of a severe urticarial rash. At the end of three weeks in the sanatorium the temperature rose slightly and the X-ray film showed a spread of disease in the left lung, and so a left artificial pneumothorax was established. The patient improved and was discharged from the sanatorium in January 1937, after five months' treatment, as fit for work. I examined her again the same month and my X-ray film showed the apex of the lung held up by dense adhesions, the lower three-quarters of the lung being well collapsed by the artificial pneumothorax. Yvonne now began work, as she was very worried about her business, for her husband had developed pulmonary tuberculosis while she was in the sanatorium, and he was also having pneumothorax treatment. By living close to her work, so as to avoid travelling, and by observing strictly two rest hours a day, from 12 to 1 p.m. and from 5 to 6 p.m., she was able to pick up the threads of the business and organize and supervise the manufacture of ladies' blouses and neckware, employing a staff which was gradually increased to fifty workers.

The pneumothorax was maintained for nearly eleven years, until March 1947, and I did the refills for the last five years. In the summer of 1938 Yvonne was admitted to hospital and operated on for an appendix abscess. In 1944 she came to see me, and somewhat shamefacedly said she was pregnant, this being contrary to my advice. However,

all went well and in September 1945 a man child was born who is now a healthy boy of nine years of age, and his mother suffered no ill effects from this contretemps.

As the left lung was allowed to re-expand a little fluid exuded at the base and eventually a layer of thickened pleura formed over the axillary region of the left lung. The whole of the left lung which was visible was studied with calcified foci, and calcified foci were also present in the upper two-thirds of the right lung, showing how much more



FIG. 36. Calcified foci in lungs.

widely disseminated the tuberculous lesions may be in the lung than the early X-rays or the physical signs suggest (see Fig. 36).

When I last saw Yvonne in 1954 she and her husband were perfectly well. I think this patient did so well because she was remarkably sensible in her methods of rehabilitation. She avoided the fatigue of travelling and was able to observe her rest hours by living close to her work, although the neighbourhood was not very attractive.

These are her reactions to the disease: "When I first was told I had tuberculosis I experienced utter despair followed by a feeling of revolt against everything. After the first week or so in hospital I

settled down, and, in spite of absolute rest, quite enjoyed myself. On going to the sanatorium I had a set-back and was very distressed, but with the pneumothorax treatment I was soon on the road to recovery. I had no previous experience of tuberculosis and listened with mixed feelings to people who stated you never would be cured. There was one other thought predominant in the early days, that perhaps I would be unable to enjoy the blessings of a family. The separation from my husband was the most unbearable part of the illness."

Thelma. Aet 27. Journalist.

I was first asked to see Thelma in September 1935. For the last two years she had been grossly overworking, seven days a week, and often all day, and sometimes until 2 or 3 a.m. During this time she suffered from a cough and frequently brought up small quantities of blood, at times waking to find blood in her mouth, but she paid no attention to it and sought no medical advice. In the spring of 1935 she had an attack of bronchopneumonia and was away from work for seven weeks. Just before I was consulted Thelma felt very weak and ill and had an attack of bronchitis. An examination of the sputum showed the presence of tubercle bacilli, and I found extensive signs of tuberculosis throughout the left lung, with a deposit at the apex of the right lung.

Thelma was a harum-scarum girl, living in a cottage in the country with her sister, and coming up to town every day to work. In her spare time, which was very little, she indulged in horse-riding and exercised the dog. She had a mop of dark hair, which was never tidy nor covered with a hat, she was small of stature, slim, restless, sanguine in temperament and entirely careless of her health.

I was able to arrange for her admission to hospital in a week or so, where treatment was begun with rest in bed and a course of injections of Sanocrysin, for we phthisiologists then worked in the golden era. Our patient made satisfactory progress in hospital, although she developed laryngitis which was pronounced by the expert as non-tuberculous. In the course of a few months she was transferred to a sanatorium and shortly after admission there I received a letter from the superintendent which rather shattered my hopes of a speedy recovery. The laryngologist took a different view and considered the laryngitis to be tuberculous, the sputum contained tubercle bacilli, the temperature was raised, and a cavity had formed in the lower lobe of the left lung. Did I agree to an attempt to establish an artificial pneumothorax? I replied that I certainly was in favour of this, and fortunately an excellent collapse of the left lung was obtained, with no pleural adhesions. Five months later the larynx, which had been cauterized, was pronounced to be healed, the sputum was free from

tubercle bacilli, the temperature was normal, the pneumothorax had been satisfactorily maintained, and the patient was taking walking exercise.

On leaving the sanatorium she was told to continue the pneumothorax refills in London and to begin part time work a month later. She disregarded the latter advice and within a week of returning home was doing full time work as a journalist, often working until 10 p.m. During the next year she led a very strenuous life, although always saying she felt very tired, in her spare time she was riding and jumping. I continued the refills until the summer of 1942 when the lung was expanding spontaneously, following a severe car accident in which she suffered from concussion with fracture of two ribs on the left side. Subsequently pleural adhesions formed at the site of the fracture and it was not possible to maintain a satisfactory collapse of the lung.

When I last examined Thelma in the spring of 1954 many calcified foci were seen in the X-ray film in both lungs and there was no evidence of active disease. The account which she gave of her reactions to the illness is not devoid of interest.

"I do not remember being particularly shocked when the doctor at home told me I had developed tuberculosis. I just did not believe him. I had no idea I was as ill as I was, but I felt I was going mad. When you confirmed the diagnosis I was almost relieved. I was not going mad and I could, for a time, give up the day to day struggle which had got completely beyond me. I do not think I ever considered dying. I certainly was not frightened. I do remember being most reassured by your very matter-of-fact attitude. You said I should be all right and I believed you. The doctor at home said so too, but he was so obviously distressed about me that I was sure he did not mean it. I enjoyed my stay in hospital. I had never been in hospital before and it was an experience. It was wonderful not to do anything at all, and to be encouraged not to do it. I liked hearing the life stories of the other patients. They had all been at it for years and years and made me feel I must be there under false pretences. The struggle for me began at the sanatorium; I was cut off from my friends, but I took my treatment with as good grace as I could and the better I got the more sick and tired I became of the whole thing. When I went home I missed the security of sanatorium life. There was more than one bad period in the first year or so when I am sure I could have let myself get ill enough to start all over again. I didn't because I simply had to go on earning my living and because I received absolutely no sympathy at your hands if I arrived with a tale of woe."

Jan. Aet 27. Independent means.

This young man served in the Polish Army during the second world

war, and thinks he contracted tuberculosis in Russia. The disease was discovered in May 1946 while in the army in Italy. He had always been very thin, and for the past year had not felt well, although the regimental medical officer found nothing wrong with his lungs. He was eventually sent to an army hospital where he was examined by a specialist and the diagnosis was established. He was sent to Paris for five months and an X-ray taken in March 1947 showed infiltration in the upper two-thirds of the left lung and in the upper third of the right lung.

I first examined Jan in May 1947, he was very thin, 5 ft. 7 in. in height, he weighed 8 st. 7 lb. (clothed). His ears were very prominent, standing out like flaps from the side of his head, his cheek bones were high, his nose aquiline, and both lips protruded. Below the lower lip, and separated by a deep groove, the lower jaw jutted out squarely and somewhat aggressively. I found him somewhat inclined to be irritable, with a choleric temperament, but he had a good sense of humour.

The sputum contained tubercle bacilli and there were extensive signs of tuberculosis in both lungs, although no cavity was seen on X-ray examination. Jan went now to Switzerland for treatment, first at one sanatorium and then at another. His condition gradually deteriorated as a cavity formed at the apex of the left lung, and eventually, in October 1948, a left thoracoplastic operation was performed, with very good results, the cavity being obliterated. The chest showed a considerable degree of scoliosis, with the concavity of the curve to the right, rather a poor result from the cosmetic aspect, but there was some scoliosis present before the operation.

When I next examined Jan in August 1949 I found no signs of active disease. The doctor at the first sanatorium described his temperament as "*pas très docile*," as he appeared unable to tolerate strict rest treatment. This doctor also took a somewhat gloomy view of his future, for he wrote to me: "*Je ne sais si ce malade arrivera à une guérison clinique avec disparition des bacilles. Les poumons atteints d'une grave tuberculose bilatérale, multicavitaire, avec très grosse caverne du sommet gauche.*"

During the next few years Jan spent a considerable amount of his time either in Switzerland or on the French Riviera with his English wife whom he had met in a sanatorium. She was also suffering from pulmonary tuberculosis and was being treated with an artificial pneumothorax. Together they rested and led a quiet life, being blessed with sufficient means to free them from any monetary worries. Jan gradually gained strength and was able to take more exercise. I examined him periodically, the last time being in 1954, and although fine râles could still be heard over the upper part of both lungs, there was no sign of recrudescence of activity. Jan wrote to me: "When the tuberculosis

was diagnosed I read the diagnosis in Latin on the army form. It was a great shock to me, as I thought I was going to die. When I was sent to a sanatorium in Switzerland I was much relieved and just gave myself up to resting."

The sanatorium doctor, however, appeared to take a different view of the patient's willingness to rest.

Norman. Aet 29. Proprietor ladies' blouse factory.

Norman is the husband of Yvonne, whose case I have described above. After his wife went to hospital, suffering from pulmonary tuberculosis, he felt run down, and for the three months before I saw him, in August 1936, noticed pains in the front and back of the chest. One sunny day, when visiting his wife, he became overheated walking quickly from the station to the sanatorium, a distance of some two miles. A few days later he felt "queer" and consulted his general practitioner, who referred him to the tuberculosis officer. After being examined he was told that he had a "chill coming on," and two days later he developed "a thoroughly bad cold," sweated violently, and was in bed for two days. He then went away for the week-end, although still suffering from the "cold," and took violent walking exercise to "sweat it out." The cold abated but was followed by a considerable amount of coughing, which continued for two weeks. The next event was a small hæmoptysis, just a trace of blood in the sputum on one occasion, with a repetition two days later. Feeling thoroughly worried now and anxious, he consulted me, and I found, as I expected from the history, signs of pulmonary tuberculosis. Despite the fact that his wife was in a sanatorium, before my examination his chest had not been X-rayed and his sputum had not been tested for tubercle bacilli. I took a film of his chest, which showed evidence of infiltration at the right apex, with calcified nodes in both root areas, and the sputum contained tubercle bacilli.

Norman was in a state of deep depression. He was a dark haired man of medium height with a sallow complexion, rather shifty brown eyes and a gloomy cast to his features. Melancholic in temperament, he was introspective and apprehensive.

"If I give up work," he said, "and go into a sanatorium for treatment I shall be financially ruined, I must keep on at work." What was I to do? After carefully considering the problem I decided to try and treat him with an artificial pneumothorax as an ambulant patient, providing he would come into hospital for two or three weeks for the pneumothorax to be induced, and that a satisfactory collapse was obtained. The pneumothorax was induced early in September 1936 and within four weeks Norman was back at part-time work,

strictly observing two rest hours each day, and spending the greater part of the week-ends in bed. Everything went off very satisfactorily, and I continued the pneumothorax for ten and a half years, the refills being gradually spaced out to five or six weeks. When the lung had re-expanded the X-ray film showed that the lesion on the right side had healed by calcification and a few calcified foci were apparent in the upper and middle zones of the left lung.

Norman recounted to me his reactions to the illness as follows: "When I first realized that my wife was ill I was very worried that no definite quality could be given to her illness. As you will remember she saw various physicians, and it was not until she had a hæmorrhage and then came to see you that any definite diagnosis was made. I was very despondent and had grave doubts regarding her recovery. I myself felt unwell and the mental gloom of those early days seemed to make me feel very much worse. When my tuberculosis was diagnosed my depression was absolute. I felt that things could not possibly get worse. After my pneumothorax, things—mental things—began to improve. My past existence had been left behind, and having reached total depression I felt that things could only improve. I knew that the environment of our early married life had had a lot to do with the illness, and that at all costs this had to be changed. This we decided to do after we left hospital and started a new system of living. We worked fairly hard and worried about work, but the rest of the time was spent as much as possible in resting and paying, as it were, homage to our illness. I must say that we were not miserable about it, but rather enjoyed it on the whole and we were inclined to see much humour in it."

James. Aet 30. Insurance agent.

Early in December 1943 James was taken ill with what was thought to be pneumonia affecting the lower lobe of the left lung. Two weeks later I was called in, as the patient was still febrile, and râles were now audible at the apex of each lung. I found the patient very ill, pale, sweating, slightly cyanosed, with the alae nasi muscles in action. He was intensely apprehensive and nervous. One sputum test had shown the presence of tubercle bacilli. In addition to the clinical evidence of tuberculosis affecting the upper third of each lung, there were signs of an effusion at the left base.

The general practitioner told me that James would commit suicide if he were admitted to a chest hospital or if he were told that he had tuberculosis, so I, somewhat weakly, compromised and arranged for his admission to a general hospital. On his way to the ward, however, he read the admission slip on which the diagnosis of tuber-

culosis was written, and, when I saw him shortly after, he was, and I think justifiably, very resentful of the manner in which he had been treated. I did my best to appease his anger and allay his fears. This illustrates what I have said before, how foolish it is to try and conceal from a patient the diagnosis of tuberculosis, once it has been definitely established.

The X-ray film of the chest showed evidence of the exudative type of tuberculosis affecting the upper third of the right lung, and the upper two-thirds of the left lung. There was also a cavity in the middle zone of the left lung, and at the left base pleural adhesions and a little fluid.

James was very unhappy in hospital, and, after two weeks, at his own request, was moved into a nursing home, where I saw him again in the middle of February 1944. He was now calm and feeling very much better, for the temperature had been normal for three weeks. Clinically there were signs of excavation at back of the left lung, just below the angle of the scapula, but a recent film of the chest showed further spread of the infiltration, so that the upper two-thirds of the right lung were now involved.

A week or so later James was moved by ambulance to a country cottage belonging to a relative, where he was to be kept in bed and nursed by his devoted wife. All this appeared unsatisfactory and rather playing at treatment, as he would not be under the constant supervision of a doctor skilled in the treatment of tuberculosis, and there would be no facilities for serial examinations by X-ray of his lungs. His doctor, however, assured me that his disposition was such that he could not tolerate hospital or sanatorium régime, and the only way in which his mind could be kept comparatively at rest was by allowing him to be looked after by his wife. I agreed with this, for in my experience, those who do not achieve mental rest and resignation during a long illness will take longer in recovering and are more prone to set-backs than are their more tranquil brethren.

The local doctor under whose care he was placed, reported at the end of March that satisfactory progress was being made. James had no cough, no sputum and a normal temperature. He added: "I think he is doing very well. His surroundings are ideal. I have warned him that he must make up his mind to three months of rest, though I propose to put him outside for some sunbathing as soon as the weather permits. His wife is a born nurse."

I agreed with the last sentence. She certainly is a born nurse. She has looked after him most devotedly throughout his illness, his convalescence, and his subsequent return to work. I replied to the doctor asking that the patient should not be allowed to sunbathe, explaining that it is considered to be harmful in cases of pulmonary

tuberculosis. I wrote this because I felt very strongly that to expose the naked body to the sun involves a grave risk of spreading or reactivating the disease, and of provoking a hæmoptysis.

Three days later James developed a small ischio-rectal abscess which was opened under pentothal anæsthesia, and about the end of June he was examined by the superintendent of a neighbouring sanatorium. The superintendent reported that the original cavity in the left lung had closed, but two new cavities had appeared on the same side, and he advised that the patient should spend a year in the sanatorium where some form of collapse treatment could be given. He concluded that if the patient did not undergo sanatorium treatment he would probably drag on as a chronic consumptive for some years and that the prognosis under ordinary conditions was bad.

This report caused James considerable distress, as he thought he was making good progress, and he bluntly refused to take the professional advice. Despite the gloomy prognosis he was clinically much better, for he had put on weight, had no cough or sputum, and was taking a little walking exercise.

I saw the patient again in the autumn of 1944, on his return from the country. He had gained three stones in weight and was feeling very well. The sedimentation rate of the red cells was normal, but the X-ray film of the chest still showed the cavity in the left lung, although it was a little smaller. This unclosed cavity was a source of danger and a menace to his future health. James now returned to work, at first two and a half days a week, gradually increasing during the next year to five days a week. I impressed upon him the necessity of always strictly observing a rest hour from 5.30 to 6.30 p.m., during which he was to lie on his bed, completely relaxed, and do nothing.

In July 1945 his wife bore to him a baby girl, who is now nearly nine years old and in good health. About this time James coughed up a little sputum, and tubercle bacilli were found in it. The X-ray film still showed the cavity in the left lung, and with the hope of closing this and averting the risk of infecting his wife and child, I advised that the left phrenic nerve should be avulsed. The left diaphragm was thereby paralysed and raised 2 in. above the level of the right diaphragm, but the cavity, although reduced in size, did not close. During the next two years James remained at work, without any set-back, and with no clinical evidence of activity. The sedimentation rate of the red cells was normal, but in the autumn of 1948, without any warning, there was a hæmoptysis of about 5 oz. of bright blood.

I took an X-ray film of the chest the next day when the lower half of the wall of the cavity appeared to be much thicker, probably due to some blood clot. For the next few weeks the patient was not so well, running a slight temperature and complaining of shortness of breath on

walking. The dyspnœa became worse, and the next summer another chest specialist was consulted who considered there was a large functional element and advised breathing exercises. I was opposed to this form of treatment for fear of activating or spreading the disease, and advised that the amount of walking should be gradually increased, and so the exercise tolerance improved.

Early next year James said that he felt very well, and a different creature from twelve months before. The breathing had improved, the sedimentation rate of the red cells was normal, and the cavity could no longer be definitely seen in the X-ray film. Three months later I was urgently sent for to see him. He was suddenly seized with an intense frontal headache, aching limbs, pains on moving the eyes, a temperature of 104° to 105° F., and sweating. His doctor feared meningitis, but fortunately there were no signs of involvement of the central nervous system. The clinical picture suggested an acute influenzal attack, and the temperature fell to normal a few days later. Three weeks after the onset of this acute illness the sedimentation rate of the red cells was normal, and the X-ray film of the chest showed no spread of the tuberculosis.

James remained comparatively well for the next two years, going abroad for holidays, but never being able to walk fast, or up hills, on account of shortness of breath. This became progressively worse and when I last examined him in the spring of 1954, although always of a melancholic temperament, he now looked more anxious and apprehensive, and was noticeably dyspnœic on dressing. I compared the latest X-ray film with that taken six years previously, the most important feature being that the original circular cavity situated in the left mid zone could no longer be seen. The phrenic avulsion did therefore appear to have achieved its object. There were now, however, numerous small translucent areas in the left lung and in the upper lobe of the right lung suggestive of small bronchiectatic spaces. The elevation of the root shadows on each side and the abnormally vertical course downwards from the root areas of the vascular shadows, indicated fibrotic changes in both upper lobes, but the trachea was central, and the heart only slightly displaced to the left. The most unfavourable feature was the complete absence of evidence of calcification after all these years.

James reported his reactions to the disease by saying: "The discovery of the nature of my illness gave me an awful shock. I had thought of tuberculosis before I was ill, but did not think I had it when it came. I used to dread your coming to see me in the hospital in case you found anything worse. I did not worry as soon as I went home and my wife looked after me. The tuberculosis has affected my life chiefly by the shortness of breath. I notice this on stairs. It has not

affected me financially or professionally. I owe my recovery largely to my wife."

This touching tribute is very true. But what of the future? The likelihood is that further fibrotic changes will take place in the lungs, with increasing shortness of breath, and the possibility of recurrent hæmoptysis. In some ways the case resembles that of Albert, described above, but the disease here remained localized to the lungs.

Piero. Aet 30. Restaurateur.

Piero was brought to see me by his Italian doctor in September 1945. Of medium height, pale, with dark hair and hazel eyes, he was normally of a sanguine temperament, but for the last few months had been feeling very tired and depressed. He had also lost over a stone in weight, and was troubled with a cough, expectoration, and night sweats.

The general practitioner told me that earlier in the year Piero had been examined at a London hospital, when the X-ray film of the chest was reported to be normal, and no tubercle bacilli were found in the sputum. He added, "This man is under-weight and emaciated. Both lungs are full of catarrh, but I can find no difference in resonance between the right and left side."

I found definite signs of pulmonary tuberculosis, and the X-ray film showed infiltration with cavitation in the upper third of the right lung, and infiltration in the left mid-zone. The sputum contained tubercle bacilli, and the sedimentation rate of the red cells was raised to 40 mm. per cent plasma/1 hour.

I recommended the patient for admission to hospital and a few days later he was taken in as an emergency with a hæmoptysis. A right artificial pneumothorax was at once induced, which resulted in a selective collapse of the right upper and middle zones. In view of the recent lesion in the left lung I wondered whether it would be necessary to establish a bilateral pneumothorax, but fortunately the left-sided lesion did not spread, and in time regressed. Owing to the development of fluid in the right pleural space, which was accompanied by rise in temperature and which required periodical aspirations, it was a year before Piero was fit to be transferred to a sanatorium. The fluid was slightly turbid and contained pus cells and tubercle bacilli. It was therefore a tuberculous pyothorax, but, despite the gloomy prognosis which is sometimes given if such a condition is not treated with a thoracoplastic operation, a satisfactory cure was effected by aspiration alone. During his stay in hospital Piero gained nearly 2 st. in weight. The pneumothorax was still maintained, although the pleural space was diminishing and the refills were small.

At the sanatorium the patient was put through a full course of

graduated exercises which included digging and cutting down trees, and on returning home in January 1947 he resumed part-time work in the restaurant. I continued the refills for another three months when it was no longer possible to find a pleural space, and the lung rapidly expanded. Piero married in the following April, having postponed his wedding for fourteen months owing to his illness, and in 1950 his wife bore him a baby girl who has remained in good health. I have seen Piero periodically since then every six months. The X-ray films of the lungs show that the lesions have healed by calcification, and the patient is leading a normal life. And this is how he described his reactions to the illness:—

“ I was very upset when I was told I had tuberculosis as I was going to be married. I was very depressed and was afraid of treatment as I had heard various alarming tales. After about three weeks in hospital I did not worry as I had confidence in my doctor. I am naturally of a cheerful disposition and I liked the sanatorium very much. The illness has not really interfered with my life.”

Stannis. Aet 30. Farmer.

One evening in 1945 a doctor in London telephoned me to enquire whether I could arrange for a relation of his by marriage to be admitted to a hospital under my care. He told me that the patient was a Pole, who had been invalided from the Polish forces in Europe on account of pulmonary tuberculosis, and who had eventually arrived at a sanatorium in Scotland. He was apparently making no progress after months of treatment, the disease was still active, and he was very despondent.

I saw Stannis for the first time early in June 1945 after his admission to hospital in London. He was a man of magnificent physique, over 6 ft. in height, with a well formed chest, but weighing now only 12 st., a stone and a half below his normal weight. He was the last person one would expect to develop pulmonary tuberculosis. While serving with the Polish forces in Italy in 1944 he spat up some blood, and was told by the regimental medical officer when he reported sick, that he was suffering from tuberculosis.

I found signs of tuberculosis affecting the upper half of the right lung and on the left side an artificial pneumothorax. The temperature did not rise above 99° F. in the evening, but the sputum contained tubercle bacilli and the sedimentation rate of the red cells was increased to 50 mm. plasma/1 hour (Westergren). The X-ray film showed evidence of fibrosis at the apex of the right lung, and infiltration in the middle zone. On the left side there was a partial pneumothorax with adhesions in the upper and middle zones. There was no improvement in his condition until the adhesions were divided about a month

later; after this the sedimentation rate fell to 25 mm. plasma/1 hour and the disease on the left side appeared to be satisfactorily controlled with the pneumothorax refills. There was still, however, activity on the right side, and so, after another four weeks, the right phrenic nerve was crushed. A satisfactory paralysis and elevation of the right side of the diaphragm was obtained, and the sedimentation reading fell to 16 mm./1 hour. The sputum was now free from tubercle bacilli and in a short time the patient was allowed to get up by easy stages, leaving hospital for the sanatorium early in October.

Stannis stayed at the sanatorium for five months, going through the routine course of graduated exercises. His progress was interrupted by the development of a small pleural effusion on the left side, which resulted in partial obliteration of the pneumothorax. On leaving the sanatorium he began part-time work on a farm, supervising only, for he had taken a University degree in agriculture. I examined him again in May 1946 when he appeared very well, with a normal sedimentation rate of the red cells, no cough and no expectoration, and sixteen months later the pneumothorax refills were discontinued. Since then I have examined him periodically every six months, the last visit being in April 1954. He has had no set-backs and does a hard day's work involving manual labour as well as supervision of others. The lesions in both lungs are only now beginning to show evidence of calcification.

Stannis reported his reactions to his illness as follows: "I remember very clearly when the regimental medical officer told me I had contracted pulmonary tuberculosis; my first thought was how long will it take to get well again? At the same time I could not believe that I, of all people, had got tuberculosis. I am absolutely sure that the worst part of the illness was the hæmorrhage; that had the worst effect on me. The first few hours after I started spitting blood I was in, I would call it, a shock condition, nearly every muscle in my body was shaking. During the first part of my illness in the Scottish sanatorium I did not believe I could get well, not having seen one patient leaving cured, and seeing more than a dozen die. After being admitted to the hospital in London confidence returned and I felt that after all I would get well, and from this time, as you know, all went well. From the time I was told I was fit to go to the sanatorium I really had peace of mind."

Walter. Aet 32. Engineer.

In the summer of 1933 Walter suffered from epigastric pain after food, and a duodenal ulcer was suspected. The barium meal examination, however, revealed no abnormality and the symptoms gradually subsided. In the autumn he was troubled by a cough with morning

sputum, and about three weeks before admission to hospital he coughed up a small amount of blood. This was followed two weeks later by a profuse hæmoptysis of over two pints, and early in 1934 he was taken into hospital under my care. I found diffuse signs of tuberculous infiltration throughout the right lung, the sputum contained tubercle bacilli, the temperature was raised, and the sedimentation rate of the red cells was increased to 38 mm. per cent plasma/1 hour. An X-ray film of the chest showed evidence of tuberculous infiltration in the upper and middle zones of the right lung, the left lung appeared to be normal.

A right artificial pneumothorax was easily induced, but the subsequent X-ray examination revealed an irregular collapse of the lung owing to axillary and apical adhesions. Walter made good clinical progress in hospital and in June 1934 went to a sanatorium for three months. On discharge, in September 1934, the artificial pneumothorax was still being maintained, the sputum contained no tubercle bacilli, the sedimentation rate of the red cells was normal, and the patient was walking six miles a day.

I next saw Walter at the end of November 1934. He had been doing full-time work for the last month, having weekly pneumothorax refills at hospital. Two days before seeing me he had what appeared to be an influenzal attack, with fever and muscular aching. I found, however, that the sputum once more contained tubercle bacilli, and the sedimentation rate of the red cells had risen to 18 mm. per cent plasma/1 hour. The lung was inadequately collapsed by the pneumothorax and there was a trace of fluid at the base. I arranged once more for his admission to hospital under my care in order to establish a better collapse of the lung by giving larger refills. After two months in hospital his condition was much improved, the lung was well collapsed although there was still an apical adhesion, and he now decided to come to me for refills. For the last nineteen years I have continued the refills, apart for a period of about two years, when his work took him to the north of England. During this time he has really kept very well, in 1942 he was troubled with his ear and a mastoid operation was performed, periodically he had a return of gastric symptoms, but the barium meal examinations were normal; and at times he became worried and nervy and was told by his general practitioner he had a nervous breakdown. The chest has given rise to no anxiety and the refills are now spaced out to an interval of five weeks. There is an apical band of adhesions so that the upper lobe is little collapsed, but the middle and lower lobes are well deflated. There is no X-ray evidence of healing by calcification, and the pleura is much thickened. It is probable that if the artificial pneumothorax were abandoned there would be very considerable displacement of the

mediastinum to the right as the air became absorbed, and very little expansion of the lung would occur. This would be likely to cause serious dyspnœa, whereas, with the inconvenience of about ten refills a year, he suffers no respiratory distress and is able to walk as much as twelve to fifteen miles a day on his holidays.

Walter's temperament is melancholic; he always comes into my room with a gloomy look and seems pleased if I say he appears tired. When I weigh him he steps on to the scales very slowly and carefully, with his eyes fixed on the arm of the balance. If I tell him he has lost a pound in weight he appears pleased, as if it justified his feeling of fatigue. If he has gained a pound he finds some reason for it, such as heavier clothes or larger meals, or more rest.

A few weeks ago I asked Walter how the tuberculosis had affected him. He replied: "When my illness began with hæmoptysis I was not very upset, as I half suspected what the trouble was before. I had not been feeling well for two years and had many colds. Both my wife's brothers," he added, "had tuberculosis and both died. I slept with the elder brother on a visit to his home. When I was in the sanatorium a patient who was pretty bad told me to abandon all ambition, and I accepted it. I was not unduly depressed, but I got attacks of depression which I do not have now. My illness has handicapped me at my work and this has produced subconscious worry. I wondered whether I could hold my job. I always enjoyed coming for my refills."

Gertrude. Aet 33. Housewife.

I was called out to see this patient early in January 1937, as she had been taken ill four weeks previously with what was thought to be an attack of influenza. At the onset there was pain over the base of the right lung, with night sweats and high fever, and on one occasion a slight hæmoptysis. When I visited Gertrude the temperature had been normal for two days and she felt much better, but there were signs of consolidation in the right lung and the sputum contained tubercle bacilli. The case was therefore one of acute pneumonic or bronchopneumonic tuberculosis, although it is unusual in this condition for the temperature to settle so quickly to normal.

Gertrude, who was married, with one daughter eleven years of age, was admitted to hospital under my care within a week, and the X-ray film of the chest showed evidence of partial consolidation in the lower lobe of the right lung. The left lung appeared normal. The sedimentation rate of the red cells was raised to 32 mm. per cent plasma/1 hour. There was now no sputum, but the temperature was again raised. I induced a right artificial pneumothorax and a satisfactory collapse was obtained. The sedimentation rate of the red cells fell to normal,

6 mm. per cent plasma/I hour, and the patient left hospital towards the end of April 1937 to continue the refills as an out-patient.

Considerably later Gertrude told me she could trace no history of contact with a case of tuberculosis. She attributed her illness to worry over her husband's work. He was in a film company and often did not come home until 3 or 4 a.m. Further, in the course of his work he drank far too much, was associated with too attractive company, and took irregular meals, which resulted in a duodenal ulcer.

I saw the patient periodically, usually every six months, and she made satisfactory progress. In 1938 she wished to give up the pneumothorax as she felt so well, and was very depressed when I advised continuing it as long as the lung was willing to remain collapsed. In 1939 a little fluid exuded into the pneumothorax space, and subsequently a pleural adhesion formed. In May 1945, after a series of very painful refills at hospital, I decided to allow the lung to re-expand. The pneumothorax had now been maintained for eight years. Three months later the lung was completely re-expanded.

Early in 1950 Gertrude seemed very upset and depressed on her visit to me, and she had lost 4 lb. in weight. I asked whether anything had happened to distress her and she told me that within the space of five weeks she had lost her eight-year-old cat and eighteen-year-old dog. During the next eighteen months she put on 23 lb. in weight, and on again enquiring how she explained this, she answered "It's that sweet shop of mine." I then found out that owing to her husband's illness she had started a tobacco and sweet shop which was doing very well, and she could not resist the temptation of helping herself to the sweets.

I continued to see Gertrude every six months, the last visit being in May 1954. The right lung has now well healed, calcified lesions being seen in the X-ray film in all zones. There is no displacement of the trachea or of the heart, and no evidence of fibrosis. It is the fibrosis which is the source of so much trouble in pulmonary tuberculosis, for it leads to dyspnoea from mediastinal displacement, to bronchiectasis, to hæmoptysis, and to persistent active foci in the fibrosed lung.

For three or four days before each visit Gertrude, although naturally calm and cheerful, became very anxious and apprehensive lest I should find any spread of the disease, but fortunately there have been no relapses. At her last visit she said, "You told me when I first saw you the trouble would last for two years, and now after seventeen years I am still seeing you." Neither daughter nor husband have contracted the disease.

When I asked about her reaction to the illness she replied: "I did not believe I had anything like tuberculosis. I could not believe it. There was nothing like it in the family. When I was in hospital I did not really worry. I did everything I was told. When I went

home I felt I was getting on well, and rested and walked as I was told. I felt no better and no worse when the lung was allowed to re-expand after being collapsed for eight years. The worst part of the treatment was the refills as an out-patient at hospital. Sometimes they were very painful, no local anæsthetic was used, and they sometimes tried several times before they could get in. The illness has not interfered with my life very much. I am naturally calm and phlegmatic and seldom let things worry me."

Geoffrey. Aet 35. Solicitor.

Geoffrey had been in the Territorial Army for several years before the Second World War. He joined his regiment in October 1939, and served abroad in Iceland and later in Central Europe. He was discharged from the forces on account of a Pott's fracture in 1946, and subsequently suffered from almost incessant colds and bronchitis. He also had attacks of palpitations and dizziness, and in the summer of 1947 was kept in bed for two months on account of his heart. In the next attack of bronchitis the sputum was examined and found to contain tubercle bacilli, and an X-ray film of the chest showed evidence of a cavity at the apex of the lower lobe of the right lung and a small area of infiltration far out in the left mid-zone.

Shortly afterwards, in November 1947, I was asked to examine Geoffrey. He was spare, having lost about a stone in weight, tall, well-groomed, with a ruddy complexion, sleek dark hair, shining brown eyes, and clear cut features. He was smiling, cheerful, and although inclined to be sarcastic, he enjoyed a joke and was fond of retailing after-dinner stories. This I learned afterwards from his frequent visits to me. When I first saw him he was naturally very depressed by the bad news, for he was married, with a daughter ten years of age, and was anxious about his family responsibilities. At this time it was possible to be admitted to a sanatorium in Switzerland much more quickly than to a chest hospital or sanatorium in England, and so, in order to avoid delay, I arranged for this.

Geoffrey arrived in Switzerland in December 1947, the sanatorium being on a mountain, about 5,000 ft. high. A right artificial pneumothorax was induced on Boxing Day, and apical adhesions were divided early in January 1948. The cavity in the right lower lobe did not close, although all three lobes of the lung were well collapsed. At the end of March the right phrenic nerve was crushed, and a month later it was avulsed as a satisfactory paralysis of the diaphragm had not been obtained, but even then the diaphragm was only paralysed for a short time. Still the cavity remained open. A pneumoperitoneum was now induced and refills given until the end of July when tomograms

showed the cavity was closed. Geoffrey began to take walking exercise and left the sanatorium in Switzerland in the middle of August 1948. The superintendent wrote to me that the disease had not been completely arrested and that the patient had lost 3 lb. in weight during his stay there. He was up seven hours a day, walking fifteen minutes a day, with a normal temperature and sedimentation rate, no cough and no sputum.

Geoffrey came to see me on his return, in order to continue the pneumothorax refills which were being given at intervals of ten days. He was delighted to be home; he said he never wished to see again the pine trees growing out of the snow on the Swiss mountain slopes; he took no interest in watching the change of the seasons when living poised above the world. Like the sanatorium "guests," described in "The Magic Mountain," who said "They could not bear to look any more at the snow, they were sick of it; they had had their fill in the summer-time, and now these masses and heaps and cushions of snow, day in and day out, were more than they could bear, their spirits sank under the weight of it."

I gradually increased the time of his daily walking exercise and made him strictly observe two rest hours each day. The film of the chest showed a solid-looking, compact shadow at the site of the former cavity. Geoffrey rapidly put on weight, gaining 16 lb. during the next three months. Switzerland suited him neither mentally nor physically, the "champagne" quality of the air did not appeal to him or stimulate his appetite. He disliked being far removed from family and friend; he loathed the perpetual chitter-chatter of patients discussing their temperatures, their sputum tests and their X-rays.

Three months later Geoffrey began to work, two hours a day, in a quiet room in the office, seeing no clients. The refills were satisfactory, at intervals of two weeks, each refill averaging 900 c.c. A marked feature was a tendency for a reaction to occur after each refill, characterized by lassitude, and a "frightful feeling like influenza" lasting usually for twenty-four hours, but with no rise in temperature. The lung tended to expand very much between refills, and it is possible that the sudden compression with the refill caused a toxæmic reaction.

By February 1950 the weight had increased to 12 st. 9 lb., a gain of 25 lb. since returning from Switzerland, and the solicitor was now doing full-time work, driving his car, and leading a normal life, apart from avoiding late nights. During the latter part of 1950 he was not so well and slowly lost about 8 lb. in weight. He was still getting the "chill" or reaction after the refills at times, when he would take to his bed for a few days. In June 1951 an abscess formed in the gluteal region, which was opened in hospital and *Bact. coli* were grown from the pus. In April and again in November of this year he had a bad

cold on the chest, was in bed for a few days, but there was no febrile reaction and the sputum showed no tubercle bacilli.

I was worried in March 1952 to find the X-ray film of the chest showing an extension of the small area of infiltration in the left lung which now involved nearly all the upper lobe. Geoffrey had been dieting for a few months to reduce his weight, and I told him not to do this. Despite the X-ray findings he felt very well and in June had been swimming. I now prescribed a course of iso-nicotinic acid hydrazide, 100 mg. morning and evening and in six weeks the weight increased 7 lb., but despite this I could hear friction over the base of the left lung, indicating that all was not well with this lung. The refills became very difficult in the autumn of 1952, and the lung expanded so rapidly that it was not possible to keep it collapsed without weekly refills, whereas for the last year or so the refills had been given at intervals of three weeks.

Geoffrey was now very anxious to give up the pneumothorax which he had had for nearly five years. I agreed to this, and during the transition period I ordered a second course of iso-nicotinic acid hydrazide for two months. In November 1952 he had a severe attack of hiccough which he attributed to over-eating. It lasted continuously for forty-eight hours. His doctor wrote to me: "I was called in and came prepared to give him some oxygen and carbon dioxide, but seeing me and my assistant enter with the apparatus frightened him sufficiently to stop the hiccough."

I have subsequently seen him at intervals of three or four months. He has remained very well, working on a farm, which he had bought as a hobby, in his spare time. The X-ray film of the chest shows no sign of infiltration on the left side. In the right lower lobe there are a few dense shadows but no evidence of calcification.

Geoffrey was not very informative when I asked him to sum up his reactions to his illness, but this is what he said: "I dreaded the refills. I dislike the idea of a needle in my chest, although I would not mind a cut in my arm. You always looked as if you were thinking about something else when you were doing my refills." Perhaps it was better he did not say any more.

Arthur. Aet 39. Doctor.

Arthur served five and a half years in the R.A.F. and was graded A.1 on discharge in October 1945. He had been troubled with a tendency to bronchitis for about a year. In July 1947 he was in hospital in East Anglia with what was diagnosed as atypical pneumonia, the X-ray film showing a shadow in the left lung field which did not clear up. Later, he was sent to see the superintendent of a sanatorium who considered the shadow was due to a bronchial carcinoma. He was then

admitted to hospital in the north of England, near his home, under the care of a thoracic surgeon for bronchoscopy and bronchography, and while these manœuvres were being performed sputum was expectorated which contained tubercle bacilli. Following this Arthur was admitted to a sanatorium in February 1948, and was next transferred to a hospital in order to have a thoracoplastic operation on the left side. Tomograms, however, showed the presence of a cavity in the right lung, so the thoracic surgeon sent him to another town in the north of England to obtain the opinion of the thoracic surgeon there. "Postural retention treatment" was advised for three months, during which time the patient would be kept lying on his right side with the foot of the bed raised. If the cavity were closed by this treatment a thoracoplastic operation would be carried out later on the left side.

Bewildered by the multitude of treatments suggested, and the lack of confidence shown in them by any of the experts, Arthur was advised by the superintendent of his local sanatorium to seek my advice, and so I saw him for the first time in March 1948.

I found him in good condition, 5 ft. 5 in. in height, and weighing 10 st. (clothed), which was as much as he had ever weighed before. He was of sanguine temperament, with sandy hair, small features, and very alert and brisk in his movements. Always cheerful and co-operative, unlike so many doctor-patients, he did not argue with me about my advice, and he did not wish to direct his own treatment.

The disease was undoubtedly active and the X-ray film of the chest showed signs of infiltration with a cavity in the right upper lobe, massive infiltration in the left mid-zone near the root, and less dense infiltration in the upper half of the left lung with two or three small cavities. Not a very encouraging picture! The sedimentation rate of the red cells was raised to 30 mm. plasma/1 hour (Westergren). I was opposed to treatment by "postural retention" owing to the risk of spreading further the infection from the left to the right lung, and I advised a left phrenic crush followed by a pneumoperitoneum.

I had never seen Arthur before, but on leaving my room he asked if he could borrow £5 as he found himself short of cash. He looked honest and I parted with it, and the loan was promptly repaid.

The phrenic crush and pneumoperitoneum were most successful. Arthur left the sanatorium early in July 1948 and continued with the pneumoperitoneum refills at home. In November 1949 the left phrenic nerve was recrushed as the diaphragm on that side was now moving again with respiration, and when I saw Arthur next he was ready and fit to begin part-time work in the Public Health Service, and this he did at the end of the year. By the end of 1951 he was engaged in full-time work, and still having the refills every two weeks. Towards

the end of 1952 I detected signs of fluid in the peritoneal cavity and the pneumoperitoneum was abandoned, a course of iso-nicotinic acid hydrazide, 100 mg. twice daily, being given for six weeks.

About this time I advised that his two children, aged thirteen and seven years, should be immunized by B.C.G. inoculation, as their Mantoux tests were negative. I last saw Arthur in March 1954, he now weighed over 11 st. (clothed) and felt very well. The X-ray film of the chest was very satisfactory—there was no evidence of cavitation, the shadows had disappeared from the lower parts of the lungs, and the apices showed evidence of fibrosis. There was, however, no calcification.

Arthur subsequently expressed his feelings to me as follows: “When the diagnosis of tuberculosis was first made, my feelings were those of utter despair associated with thoughts of suicide. I had a tremendous fear of the future and felt that I would rather die than perhaps be an invalid for the rest of my days, which may be numbered.

“Later, when I was moved to a sanatorium I soon settled down to the realization that if I played my part then I had a fair chance of recovery. I gathered around me a collection of good books which I found were excellent medicine to keep my mind well occupied. Thus passed the first few months in comparative contentment, but then there came a time when I felt that any active treatment was being too long delayed. I became terribly anxious to know the opinion of my various medical officers, but nobody would give me even the smallest piece of information. This only served to upset me and made me very resentful, as I felt that I was being treated as a mental defective. Finally things were brought to a head when I started to disobey the rules, and after a ‘spot of bother’ I had a long talk with the medical superintendent who more or less stated that no one could decide what to do for me. This made me feel desperate, and then he put forward the suggestion that I should be examined in London by you. This cleared the air. An appointment was made, and, accompanied by my wife, I made the journey to London by train, and was examined by you the following day. For the first time since my illness I had found a doctor who treated me as a colleague, who proceeded to make his diagnosis swiftly and surely, and who decided upon the treatment without the slightest hesitation. For the first time the iron curtain, which had, up to that time, existed between my medical colleagues and myself, was quickly raised, and what a relief. For the first time I had real hope of recovery, and, then and there, I made up my mind that I should one day, not so far distant, regain my health sufficiently to allow me to continue my life’s work, because you told me that I could and would do so.

“As you know, sir, all this has turned out to be correct, and I

am now back at work and able to hold my own with the rest of the world."

Trevor. Aet 46. Veterinary student.

In 1941 Trevor, who was then a glider pilot in the Army Air Force, had an attack of right-sided dry pleurisy. He was in hospital for several months, when it was decided that the condition was not tuberculous and he returned to flying duties. He subsequently had two attacks of jaundice and, in 1944, was invalided from the forces on account of a nervous breakdown. Owing to a very strained state of mind his doctor advised him to take up something in which he was likely to be really interested, and so he began a course as a veterinary student. He was well off financially and could deal with the classes in a dilettante spirit.

In the winter of 1947 Trevor had pain again in the right side of the chest, and brought up thick dark sputum with a "graveyard" taste, which, he later told me, displaying his scientific knowledge, was probably due to an infection with a "mould." In the spring of 1948 an X-ray film was taken of the chest, and this showed evidence of infiltration of the right upper lobe, thickening of the right lesser interlobar septum, and what was described as a small scar at the left apex.

Early in June of this year he had a febrile attack and was in bed for a week, and soon afterwards I was asked to see him. He was a big man, 6 ft. in height, and weighing 11 st. 13 lb. (clothed), which was about a stone under his usual weight. He had ruddy cheeks, a round face, undistinguished features, and a hearty manner, which might have been assumed to cover an inferiority complex. Before I saw him he had been divorced, chiefly on account of inability to consummate the marriage. He was proud of the anatomical and pathological knowledge he had acquired during his veterinary studies, although he had recently failed in the pathological examination, and liked to refer to his symptoms and lung lesions in what he considered to be the correct technical terms. His general practitioner described him as "a very sanguine person and keen to maintain his share of the conversation."

I found signs of active disease in the right lung, with dulness, bronchial breathing, and râles increased by cough over the upper lobe. The sedimentation rate of the red cells was increased to 25 mm. per cent plasma/1 hour, and the X-ray film showed evidence of a small cavity in the right upper lobe with a few calcified spots around it. There was a small area of infiltration in the left upper zone, and the sputum contained tubercle bacilli. I arranged for the right phrenic nerve to be crushed, and when I next saw Trevor ten weeks later he was very much better. He had spent the time in bed at home, being carefully nursed and had gained 30 lb. in weight, and was now 14 st.

3 lb. (clothed). The sputum was scanty and showed no tubercle bacilli, and the temperature was normal. The right diaphragm was paralysed and had risen 3 in., and the right apical lesion was well compressed.

Early in November 1948 the weight had risen to 15 st. 1 lb. (clothed) and Trevor was now up six hours a day and walking half a mile twice a day. In March 1949 I found him not quite so well following a cold, and the sputum again contained tubercle bacilli. His weight had risen another 6 lb. and the sedimentation rate of the red cells was normal, 2 mm. per cent plasma/1 hour. He was very patient but bored. In May 1949 there was an improvement, so much so that he was having golf lessons and driving the car, but he could not play bowls as it made him short of breath. The weight was up to 15 st. 8 lb. (clothed) and he was walking four miles a day. The sedimentation rate of the red cells was still normal. Trevor went on well during the summer, the sputum tests being negative; during August he went sailing on the understanding he was not "to touch a sheet."

In September 1949 a sputum test was positive and the sedimentation rate of the red cells had risen slightly to 7 mm. per cent plasma/1 hour. The right diaphragm was still high, but it moved an inch on full inspiration, and two small cavities could be seen in the X-ray film in the right upper lobe.

From September onwards the sputum consistently contained tubercle bacilli, and, in view of the risk of the disease spreading to the opposite lung or to other parts of the body, I advised a thoracoplastic operation. The tomograms showed evidence of a small cavity in cuts 11 and 12, and there was thickening of the pleura at the apex of the lung, so that it was unlikely the cavity would ever close.

Trevor was very depressed when he learnt of the proposed operation. He said he did not dread the operation but the "permanent crippling." I reassured him to the best of my ability that there would be no permanent crippling, but I hoped a permanent cure, and that there would be very slight chest deformity. This is really what he feared when he said "permanent crippling." His doctor told me that he had always wanted to show that he was a "he-man." At the University he was a savage boxer, in the Army he insisted on being in the Air Commando and led a force of gliders.

A day or so before the operation he wrote to me: "I am very happy and confident about the operation. Every time I whip a 'nummer' (?) of spittle into the spittoon now, I look at it and say, 'Enjoy yourself well, my children, I fear your scope is going to be severely restricted. I feel 1950 is going to be a good, if very hard, year. One can feel the sap stirring.'"

The operation was satisfactorily performed early in 1950, in two stages, the five upper ribs on the right side being removed. Trevor

was extraordinarily courageous after the operation, doing his breathing exercises and coughing up the sputum although it caused him considerable pain. He was much less distressed by the first stage operation than any patient I have seen. The day after the operation I went into his room to find him propped up in bed and whistling. The second stage made him much more ill, and he had great difficulty in maintaining his cheerful outlook.

I saw him again in June 1950, he had done very well and was only bringing up two little blobs of sputum a day, which contained no tubercle bacilli. He was walking a mile a day without fatigue. I advised him to give up his veterinary course, there was no reason for continuing it, and he could occupy himself in supervising the family estates and farms as much or as little as he wished.

Trevor had now no more set-backs. He married very happily in the summer of 1951 and became more self-reliant and gained confidence. He was taking a great interest in the farm and making plans for a trip to Kenya. Next year he flew there and back, returning by Comet with no distress, and when I saw him for the last time in July 1952 he looked and felt extraordinarily well with no cough and no expectoration. During the mornings he worked for two hours in the office, and in the afternoons was in the open air on the farm.

Two years later Trevor gave me a very illuminating account of his reactions to the illness:

“When I fell ill, I knew at heart from the first that there was really something wrong. Never thought of tuberculosis (that being essentially something the other man gets, not oneself). When it was diagnosed, I felt incredulity and a strong sense of unreality. But one's overmastering feeling, when one had got over incredulity, was relief, on two grounds. First, here was an actual physical explanation of one's difficulties; it was not just one's own laziness and faults of character, which one was beginning to despair of overcoming. Secondly, one could at last relax without even my Gascoigne conscience nagging at one, the matter being too serious to play with. I don't think I ever felt any real fear about it, the sense of unreality and the immense relief were both too strong. I knew it could prove fatal, but I don't think I ever really felt that as a practical possibility, and anyway it didn't really seem to matter; one could deal with that when it arose.

“The first period, when you tried bed-rest, I think I mostly luxuriated in idleness and lack of responsibility. My conscience plagued me a bit for not taking advantage of the time to read all the stuff I had promised myself to read when I had enough time, and wasting time reading silly thrillers, etc.; but not too badly.

“Looking back, I think that this attitude helped me a lot. I imagine it would have been far harder, and worse, for a less self-

centred and introspective man, who had hitherto been more successful in what he had tried to do; and especially had greater immediate responsibilities, such as a wife and children dependent on him. I was glad my divorce had gone through before all this arose. Also, most important, I had no money worries.

“The relapse was a serious jolt; and I think that quite the worst part of the illness was the (quite unjustified) fear of coming out of the operation a cripple, a nuisance to oneself and everyone around one, and an unpleasant object to other people. I had never been very vain about my personal looks but had always kept my body reasonably fit; and the rather persistent notion of what it might be reduced to was very unpleasant. There was no difficulty in deciding on the operation, and I was quite determined to go through with it from the first; but one did not like the idea of what it might do to one. I think it would help a lot if one could see a few fit and successful examples of thoracoplasties at this stage. The waiting to get into hospital was distinctly trying.

“Once in hospital, the absolution from responsibility was again a great relief, and I found that a slight knowledge of medicine and pathology made the technical details very interesting. The house surgeon asked me the night before the operation whether I had the wind up; and I told him quite genuinely that I had not. I had handed over the responsibility to the surgeon and the team, and it was up to them to worry, not to me. I think the fact that the surgeon was going to operate under a general anæsthetic was a big help here. I expected a good deal of pain on coming to and after; but was helped here by two things; first, it would be all over when one came to, and when there is no let-out things can usually be borne; secondly (mental twist that I have since learned is not uncommon) I felt very strongly that I had escaped a very real chance of a pretty uncomfortable time in the war, and could jolly well take it now to make up. I had always trained my blokes in the war on the tacit understanding that we were all in this together, and that whatever we took, we took together (subject to the freaks of luck); and when I was not permitted to go into action with them, I felt I had let them all down badly. I had always been certain that whatever happened I should not let them down in action; but they had gone in without me, and I had never been able to prove it. It felt like a debt; and here was a chance to pay off some of it. It really felt as if one was paying off something of what one owed to those who had died painfully, or lived to be cripples, and who had gone into that show trusting to what one, and others, had trained into (and out of) them; and removed the feeling that one had tricked them and then side-stepped. These things, and most of the emotions that really move one most strongly, are not rational.

I was intensely surprised by how little there really was to endure when one came to. All the same, I funk'd the second operation more than the first (though I think I really knew from the first that at least two would certainly be needed; but the by-play that the first one might have done the trick nevertheless helped). I was glad there was not a third.

“One's convalescence fell a little bit flat! One could no longer feel at all the hero; and at the same time one's progress was too slow to really feel at first that one was getting anywhere. However, a bit of philosophy, natural laziness, and a feeling that after all one really had a most unassailable excuse for slacking, tided that over. I am now really very fit, doing, and looking forward to doing steadily more, and working half-time in the family business, where I think I really am of some help. Of course, I have been immensely lucky in my second marriage, and my wife is a tremendous help in so many different ways; and we really are happy, which makes a tremendous difference. I have been very lucky. And, oddly enough, I have gained so much through my illness that I would not undo it if I could. It has been very much worth while in all the things that matter. But, as I say, I have been so much luckier than the average chap, in so many ways.”

Malcolm. Aet 46. Pharmaceutical chemist.

Malcolm considered that he contracted pulmonary tuberculosis from a dispenser who worked in his shop. Ever since the introduction of the National Health Service in England in 1948 he had been overworked, dealing with the masses of prescriptions which poured into his shop every day as the patients left the doctors' surgeries.

The chemist was nondescript in appearance, of medium height, melancholic in temperament, and had suffered from an anxiety neurosis seven years previously. From January 1951 he began to lose weight rapidly and suffer from indigestion. He was also very tired and was troubled with night sweats. The general practitioner arranged for an X-ray examination of the chest which revealed the appearances of tuberculous infiltration of the right lung.

I first examined Malcolm in May 1951. He looked ill, was a stone underweight, and there were signs of tuberculosis in the upper two-thirds of the right lung and in the mid-zone of the left lung. The film of the chest showed evidence of infiltration in these areas, with possibly a small cavity in the right mid-zone. The patient did not wish to come into hospital and so was treated at home with bed rest, daily intramuscular injections of 1 G. streptomycin, and 18 G. para-aminosalicylic acid daily by mouth in doses of 3 G., at intervals of two and a half hours.

When I next examined the chemist in August 1951 I found con-

siderable improvement, the clinical signs in the lungs were less marked, the X-ray film showed clearing of the infiltration in the right mid-zone, and the sedimentation rate of the red cells was 11 mm. per cent. plasma/1 hour. He had now received 90 G. of streptomycin by injection, and 18 G. of P.A.S. a day by mouth for six weeks. Owing to vomiting the dose was then reduced to 9 G. a day which caused no distress. He felt very well and had gained 8 lb. in weight.

Early in November the patient was up six hours a day and walking half a mile a day. The sedimentation rate of the red cells had fallen to 5 mm. per cent plasma/1 hour, and the X-ray film showed no change. Coarse râles were still audible over the right upper lobe. In March 1952, although Malcolm said he was feeling extremely well, his condition had deteriorated. The weight had fallen by 5 lb., the temperature was 99° F. in the afternoon, the sputum contained tubercle bacilli, and the sedimentation rate of the red cells had risen to 17 mm. per cent plasma/1 hour. I now was able to persuade him to come into hospital, where he remained for eight months. Tomograms showed a cavity in the right upper lobe and, after a course of iso-nicotinic acid hydrazide, an apicolysis with plombage was performed on the right side, portions of the second and third ribs being removed, the strip being carried down to the seventh rib posteriorly, and nineteen leucite balls were inserted into the extrapleural space. There was considerable clinical improvement after the operation, and although no cavity was revealed by tomography, the sputum still contained tubercle bacilli. A further course of streptomycin, P.A.S. and iso-nicotinic acid hydrazide was now given, and continued after the patient's return home.

The type of operation performed in cases of this nature, whether thoracoplasty, lung resection, or apicolysis with plombage, appears to depend largely on the idiosyncrasy of the surgeon. I am not very much in favour of apicolysis with plombage, although the results with leucite balls are better than those formerly obtained when wax was used. The leucite balls are radio-translucent, but with wax, which is radio-opaque, it is not possible to see what is happening in the underlying compressed lung. In one of my cases a cavity formed, giving rise to intermittent attacks of high fever for which no cause could be found until the cavity became so large that its lower margin appeared below the wax plombage. The wax had to be removed and thoracoplasty performed.

I examined Malcolm again towards the end of January 1953 when he said he was doing "quite nicely," but there were signs of streptomycin toxicity, visual disorders and loss of balance in the dark, and so I advised that the streptomycin should be discontinued. Three months later there was a considerable improvement. The patient's weight had increased, the sedimentation rate of the red cells had fallen

to 3 mm. per cent plasma/1 hour, the vestibular nerve disturbance had disappeared, no tubercle bacilli were found in the sputum, and he was up ten hours a day, observing two rest hours daily. The X-ray film, however, showed a slight increase of the infiltration in the left lung. I advised a further three months' course of iso-nicotinic acid hydrazide, and told the patient not to rush back to work. In August 1953 Malcolm was considerably better and working four hours a day. The shadows in the left lung were less noticeable in the X-ray film, and the sedimentation rate of the red cells was normal. By December the X-ray film showed early calcification in the lesion in the left lung, there was no cough and no expectoration, the sedimentation rate of the red cells was normal, and the patient was walking two miles a day.

I last saw Malcolm in April 1954. He was then very well indeed, and leading what he described as "a very pleasant life." Contentment often comes of simplicity; dispensing and a television set provided all he required. He walked a mile or so a day, worked in his shop four hours in the morning and an hour and a half after tea, went to bed for two hours in the afternoon, and spent the evening indoors. The lesion in the left lung consisted of only a few calcified shadows, as seen on the X-ray film.

On enquiry about his reactions to the disease he replied: "When my doctor first told me I had tuberculosis I just could not believe it. It upset me very much and I felt it just could not happen to me. Gradually I became more resigned, but I was still somewhat resentful. In hospital I usually felt cheerful. The operation upset me a lot and I felt I might never recover. All I wanted to do was to get back to my work. My job is my life and I have no hobbies."

* * * * *

I examined Malcolm's son, a boy of eighteen years, in July 1951. He felt perfectly well and I could find no abnormal physical signs in the lungs. The sedimentation rate of the red cells was normal, but the film of the chest showed two soft shadows in the right mid-zone. Ronald was put to bed and given a course of streptomycin and P.A.S. and then allowed up in graduated stages. He returned to work the following March having had a mild tuberculous infection which, as shown by subsequent X-ray films, healed by calcification.

This illustrates the problem with which we are now so frequently faced as the result of mass miniature radiography. What is the significance of small shadows seen in the X-ray film of the lungs in persons apparently in good health? Are they tuberculous in nature? Is the disease active? Must the patient go to bed and submit to a prolonged course of antibiotic treatment? Alternatively should he continue

with his work and take iso-nicotinic acid hydrazide by mouth for three months? If the shadows disappear under treatment does it mean that they were tuberculous and that the disease was active? I have never received a satisfactory answer to these questions. If however, the lesion calcifies while under treatment, it presumably was tuberculous in nature.

Wilfred. Aet 68. Landowner and farmer.

Wilfred is an example of senile tuberculosis, as he did not develop the disease until he was sixty-eight years of age. I was asked to see him early in February 1950 on account of a cough with expectoration of three weeks' duration, and considerable breathlessness for which no cause could be found. He also complained of substernal pain on yawning, coughing or on taking a deep breath.

I found that the percussion note was slightly impaired over the mid-zone of each lung, with vesicular breath sounds, but many fine râles were audible on deep inspiration. An X-ray film showed evidence of extensive tuberculous infiltration in the lower two-thirds of the right lung, and to a lesser degree in a corresponding area on the left side. Wilfred was admitted to hospital shortly afterwards, when the sedimentation rate of the red cells was raised to 65 mm. plasma/1 hour (Westergren). He was afebrile and no tubercle bacilli were found in the sputum or in the stomach washings. After a course of 70 daily injections of 1 G. streptomycin, with 18 G. daily of P.A.S. by mouth, there was marked improvement. The sedimentation rate fell to 7 mm. plasma, the X-ray film showed very considerable clearing of the shadows in each lung field, and the cough and dyspnoea were relieved.

Wilfred was a big man, nearly 6 ft. in height and weighing 12 st. (clothed). His countenance was usually cheerful, but he had suffered on several occasions from fits of intense depression for which no definite cause could be found, and which usually disappeared quickly on going abroad for a holiday. When not in one of these phases he was friendly and co-operative, although he resented being kept in bed in hospital and was very anxious to go home. During his stay in hospital he was considerably upset by a doctor friend who visited him and cheerfully remarked: "You ought not to be in hospital, you would die easier at home."

Wilfred left hospital early in May 1950 and I examined him again about four weeks later. He was now up eight hours daily and observing two daily rest hours. I found considerable improvement, the shortness of breath had disappeared, and the film of the chest showed only heavy root shadows, with a few fibrotic shadows in the mid-zones. In the following November he had gained 21 lb. in weight since the beginning

of his treatment and was feeling very well. The sedimentation rate of the red cells was normal.

I did not see this patient again until August 1951. He told me he was still very well, continuing his usual activities supervising his estate and farm, and walking three or four miles a day. Perhaps this was too much, for his wife intervened to say that on coming back from his walks he looked completely washed out, the colour of chamois leather. In October 1952 I found him still very well, the X-ray appearance of the chest showed no change, and the sedimentation rate of the red cells was normal.

Early in 1954 Wilfred went for a sea trip, but, on arriving in Italy, he felt ill and returned home as quickly as possible by train. I examined him at the end of January and found the sedimentation rate of the red cells raised to 42 mm. per cent plasma/1 hour, and the X-ray film showed the shadows of fresh infiltration in the right lower zone. There was clearly a relapse. The patient was very unwilling to come into hospital again, but consented to go to bed at home, and to have a course of iso-nicotinic acid hydrazide, 100 mg. twice daily, for three months.

Wilfred came to see me again at the end of this period, when I found that the chest condition had once again improved in a remarkable manner. The area of infiltration in the right lung had cleared, and the sedimentation rate of the red cells was again normal. Physically, he said, he felt very well, but once more was very depressed, and had been so for the past five months. He could not shake the depression off and attributed it to business worries. During the last war he had lost two sons, the surviving son was not interested in the farm, and there was no one with whom he could discuss his agricultural and farming problems.

During the next month the depression became worse and worse, he could not shake it off, he was sleeping badly and, on the advice of his general practitioner, it was decided that he should consult a psychiatrist.

In 1953 Wilfred replied to my enquiries about his reactions to his illness. He wrote: "On your diagnosis of tuberculosis I was not worried in the least, as I felt it was through no fault of my own. All the time I was in hospital I was perfectly free from mental worry, in fact was surprised when your assistant often said to me, 'Whatever you do, don't worry,' and I thought, why say this, I have nothing to worry about and do not do so. The worst part of my illness was caused by my desire to get home, as you will remember. Having done so, my mind was completely at rest. I did some work in the mornings and lazed in the garden in the afternoons. Affairs thenceforward went reasonably well with me, I had no mental disturbance whatsoever, and

look back on two happy years with good reports from you at the two visits I paid you. Unfortunately my mental condition is bad today, but I do not think it can be in any way traced to my pulmonary tuberculosis. Actually I have had several bouts of these depressions, the first really bad attack about the year 1931, induced no doubt by business worries, when my brother-in-law took me to Norway for some six weeks and I returned quite cured. Another in 1939, induced, I believe, by fear of what was to come, and the same good friend took me on a pleasure cruise to the West Indies, from which I again returned perfectly cured and in good spirits. Thenceforward I was quite all right until about this time last spring when, as a last hope to get rid of my depression, I was flown (being too weak to resist) to South Africa. I had scarcely been there a fortnight when I felt perfectly all right and realized what a fool I had been and vowed I would never get like it again. I am sad to say the depression returned about five weeks ago, and in spite of my having gone to Scotland for nearly three weeks, returning a few days ago, the depression is still with me. As you know, this is a dreadful condition to be in and the suffering very great. I believe the only answer is to live courageously and no one can give an easy remedy."

June. Aet 22. Red Cross Nurse.

The V.A.D.

June took up nursing in the Red Cross as a V.A.D. as her war work in 1939. Much later she told me that as a child she always managed to catch anything that was around and that she had been stupid to take up nursing. Early in 1940 she suffered from influenza, followed shortly after by German measles, followed by cerebro-spinal meningitis. Having displayed her liability to pick up infections in no uncertain manner the authorities sent her to what they called an "out-station" which dealt mostly with cuts and sprains, where she was less likely to be exposed to infection. After five months, however, June was recalled to hospital, and in November 1940 developed scarlet fever. On recovering from this, and with this dreadful record of susceptibility to infective illnesses, June was selected by the authorities to nurse patients suffering from pulmonary tuberculosis in its most virulent forms. No Mantoux test was performed to see whether she was in any degree immunised against the disease, or whether she was virgin soil. Virgin soil, however, she proved to be. There were no masks for the nurses to wear when attending to the patients and the method of sterilizing the sputum mugs left much to be desired. Further, owing to the air-raids the nurses had to sleep in underground wards in bunks arranged in tiers, with little or no ventilation.

June developed a cough in the winter of 1942, but took little notice of it, and it disappeared in the spring of 1943. In the following summer, however, it returned and about this time her friends remarked on her loss of weight. She also began to be conscious of night sweats, which she attributed to too heavy bed clothes. June was an active, athletic girl, fond of tennis and cricket, and she would not face up to the fact that she was not well. Soon her hand was forced, for after falling in a race in the hospital sports, in addition to a black eye, she developed a persistent pain in the left side of the chest for which she reported sick two weeks later thinking a rib might be fractured. On X-ray examination it was discovered that she had pulmonary tuberculosis affecting the left lung, with pleurisy.

June told me later: "I do not think I have ever been so shattered or depressed in my life as I was when they told me I had tuberculosis. I had always been so active that the thought of being stuck in bed for weeks, let alone months, appalled me. I think had I known how many months, I should have given up in despair. However, one becomes optimistic. I suppose it is because most of the time you feel very well with tuberculosis and you do not really have any pain, so you always think it will be the next month you will get up after your monthly examination, and, if it is not, well it is sure to be the next. In this way, funnily enough, the time goes quite quickly, and suddenly it *is* your month, and you can begin to get up, and you look back and think how amazing it is that you have really been in bed all that time. I would like to make it clear that I think it is only possible to settle down to a routine when everyone else around you is doing the same. You do not become so unsettled and impatient that way.

"I find it quite impossible to relax at home and become resigned to my bed, because there is always so much happening and so many queries to be answered of which only I, when I am there, seem to know the answer." (June was married now.)

"I should have to be drugged into apathy or semi-consciousness really to relax at home. I do not say it is impossible for everyone to rest at home because circumstances alter cases, but I should think it very difficult. For one thing you always seem to be doing things you should not, possibly only little things, because you just cannot keep on asking people to do them for you all the time. For another thing, when people come it is awful to have to lie in bed and hear them talking and not know what is going on; at least it is for me because I am eaten up with curiosity."

I first met June when she was admitted under my care to hospital soon after the tuberculosis was diagnosed in September 1943. She was an attractive girl, 5 ft. 4 in. in height, with dark hair, brown eyes and a pink complexion. There were signs of tuberculosis over the

greater part of the left lung and at the right apex. The sputum contained tubercle bacilli. The sedimentation rate of the red cells was 56 mm. plasma/1 hour (Westergren). The temperature was normal during her four weeks' stay in hospital in London, and the sedimentation rate fell to 20 mm. plasma/1 hour (Westergren).

The Scottish Sanatorium

June was transferred to a sanatorium in Scotland in October 1943. The X-ray film showed infiltration in the upper zone of the right lung; in the left lung there was diffuse infiltration in all zones, with pleural thickening at the base. There was a suggestion of softening in both upper zones. June felt well, had no cough or sputum, and the sedimentation rate of the red cells was 26 mm./1 hour (Westergren). She was a very good patient and was kept strictly at rest in bed, but during the next two months the disease progressed with cavity formation in the right upper lobe, rise of temperature and a sedimentation rate of 41 mm. plasma/1 hour (Westergren). A right artificial pneumothorax was now induced with marked improvement, after a few small apical adhesions had been divided. The left lung appeared also to be improving, and the sedimentation rate fell to 20 mm. plasma/1 hour (Westergren).

Unfortunately in February 1944 the temperature and the sedimentation rate of the red cells rose again, and the X-ray film showed evidence of a small cavity at the left apex. June was behaving true to form, displaying her feeble resistance to any variety of infective illness. It was decided to try to induce a left artificial pneumothorax, although the chance of obtaining such a satisfactory collapse on the left side as on the right was not so good owing to the previous pleurisy on the left side. Despite adhesions at the apex a more satisfactory collapse was obtained than was expected, and in June 1944 a few adhesions were divided at the left apex.

June continued to make good progress, and on leaving the sanatorium at the end of January 1945, after a stay of sixteen months, she was up all day and full of energy, with a normal sedimentation rate, no cough, no sputum and a bilateral artificial pneumothorax.

Refills in London

After staying in Scotland a few months June came to me in London for her refills. She was then having weekly refills on the right side and fortnightly refills on the left side. When I saw June in April 1945 she seemed to be very well, both lungs were well collapsed although there were a few adhesions at the left apex. There appeared to be every

prospect of the lesions healing in each lung if the pneumothorax could be continued for another four or five years. Next month June married and had to submit to two refills while on her honeymoon.

In August there was the first indication of possible trouble in the future. I noticed a trace of fluid in the costo-phrenic angle on each side on screening the chest. This soon absorbed, but in February 1946 a little fluid again formed on the right side, which persisted for over a year. June was now leading a normal life at home, looking after the house, feeding the animals and riding. She went for a holiday in Switzerland and indulged mildly in winter sports. She wanted to appear a hundred per cent fit, chiefly, I think, for the sake of her husband who was fond of the outdoor life. Apart from the inconvenience of refills every two weeks, everything appeared to be going well until August 1948. The symptoms now first appeared in the left lung which proved to be the prelude to the series of disasters which was to follow. June noticed that when lying on the left side or on her back she had some difficulty in breathing, and was conscious of a bubbling sound under the breast bone. I could hear rhonchi close to the left border of the sternum as she lay on the left side, but none when she turned on the right side, and I thought she had a bronchial cold. A further unfavourable sign was that the film of the chest now showed a denser band of adhesions at the left apex. A week later these bronchial signs had completely disappeared, which was opposed to a diagnosis of tuberculous bronchitis.

I continued the refills, and once more all appeared to be well until the spring of 1949, when June said she had felt "toxic" after the previous refill. She had also been thrown off a horse and hurt her back, and this was followed by a cold, a "bronchial" cough, and tubercle bacilli were again found in the sputum. It was evident that the pneumothorax was not controlling the disease, the active focus was almost certainly in the left upper lobe where the lung was not adequately collapsed owing to the adhesions. Tomograms confirmed this view, as a small cavity with a fluid level was seen in the left upper lobe.

I was convinced that the pneumothorax treatment had failed and would never be successful and so arranged for a consultation with a surgeon. He did not think it would be possible to divide the apical adhesions, and he did not consider that a thoracoplasty would collapse the cavity better than the pneumothorax, which was not at all. The alternative operation was resection of the affected portion of lung, followed probably by a partial thoracoplasty, but he did not advise this at present. June was told to rest more and arrange for extra help in the house, and I increased the pressure in the left pneumothorax to try and compress still more the left upper lobe.

There was some improvement during the summer months, the

cough and sputum disappeared and there was a gain in weight. Early in November, however, June caught a cold, she felt tired, and was coughing a good deal in the morning, bringing up sputum, and two weeks later I arranged a second consultation with the surgeon. He now advised that the patient should be admitted to hospital to allow



FIG. 37. Tomogram showing left pneumothorax with apical pleural adhesions and thick-walled cavity in the partially collapsed left upper lobe.

the right lung to expand, under cover of antibiotics, as a preliminary to surgical treatment on the left lung.

June was admitted to hospital early in 1950. The sputum contained tubercle bacilli and the tomograms showed a cavity with a thick wall in the collapsed left upper lobe (see Fig. 37). The right lung was allowed to re-expand under streptomycin cover. The patient was very intolerant of P.A.S. and could only take small doses, 2 G. t.i.d.; soon even the sight of the bottle was sufficient to make her feel sick, and so it was discontinued. On leaving hospital, in the middle of March, the

right lung was almost re-expanded and there was no mediastinal displacement. In some ways she seemed rather better for her seven weeks' rest in hospital, for she had gained 8 lb. in weight and was apyrexial with a normal sedimentation rate.

At the end of May June came into hospital again for the operation. It was found, however, that the sedimentation rate of the red cells had risen to 30 mm. plasma/1 hour (Westergren), and the shadow of the old lesion in the right upper lobe looked rather more obvious in the X-ray film. The operation was postponed indefinitely. June was kept in hospital for two weeks and given small doses of P.A.S., which she took intermittently. She returned home, carried on with her housework, looked after the animals and tried to lead a normal life. Although the sedimentation rate improved again to 9 mm. plasma/1 hour, during the summer, she did not feel fit, and had a cough with a little sputum. During July June and her husband went abroad again for a holiday, and an X-ray on her return showed a uniform shadow about 2 in. in diameter in the right upper lobe. It looked like a tuberculoma. The temperature was rising to 100° F. sometimes in the afternoon, and the sputum was blood-stained at times. When I saw this large shadow in the right upper lobe, I wished we had not allowed the right lung to re-expand. At any rate the disease on this side had been well controlled by the artificial pneumothorax, and the decision to allow it to re-expand so that an operation could be performed on the left side, was largely forced by the patient, and especially by her husband's desire for her to be one hundred per cent fit. I did not attempt to re-induce the pneumothorax on the right side; it would probably have been impossible, and in any case it would have made the patient feel that all the many years treatment on the right side had been in vain. I gave no more antibiotics, but continued with the refills on the left side and during the autumn the shadow in the right lung gradually faded, the sedimentation rate of the red cells returned to normal and the patient once again felt very well.

In February 1951 there was another relapse. June complained of cough and sputum and of a "rattling" sensation in the left side of the chest, and this continued until the end of May, when I had another consultation with the surgeon. The X-ray film indicated that the thick-walled cavity was still open in the left upper lobe, but the right lung appeared now to be satisfactory, and the surgeon said she should come into hospital again for operation.

The Operations

June was admitted to hospital again for operation in the middle of June 1951. The fifth left rib was removed, and the apical and dorsal

segments of the left upper lobe were resected after preliminary decortication of the lung. The parietal pleura, which was also stripped off the chest wall, was several millimetres thick. After the decortication the lung expanded freely, there was a little bleeding on the surface which was easily stopped. A cavity the size of a two-shilling piece, and several caseating areas were present in the portion of lung removed. A segment of bronchus was examined microscopically and no evidence of tuberculous bronchitis was found.

The temperature was 101.2° F. on the evening of the operation, and the next day it was 101° F. in the morning and 102.4° F. in the evening. I did not see June until the fourth day. Just before I went into her room my house physician said, "She is not so well today." I did not think there was anything seriously wrong, but on going into the room, as I stood at the foot of the bed near the door, I found her lying on her right side turned away from me, and almost on her face.

On the other side of the bed, in this small room, was a house surgeon, massive and expressionless; near him a taller and older man, a surgical assistant, and lolling across the armchair, a female figure, in a white overall, who was, I soon discovered, the inevitable physiotherapist. She appeared to be a somewhat bored spectator, awaiting orders to get busy on the patient. I looked enquiringly around, no one spoke until eventually the elder surgeon murmured, "She's very bad."

I was horrified. My heart sank. I was appalled at the thought that my patient was dying. I asked my house physician to fetch a nurse, and the two surgeons and their accompanying physiotherapist went out without a word. I walked round the bed and looked at the patient; her normal pink complexion had completely faded; her cheeks were pale, with venules standing out in pink strands on a faintly yellow background. She stared at me, a somewhat aggrieved look in her brown eyes, but did not appear to recognize me. I said "How are you?" She murmured something unintelligible. I felt the pulse, it was of poor volume and rapid, 140 beats a minute. The respirations were 30 a minute, and the temperature 101° F. I listened to the back of the chest; the right lung was clear, but there were râles throughout the left lung with weak breath sounds. There was no displacement of the heart to the left. On leaving the room I found the surgeons waiting outside. The elder said: "She was all right until last night. She must have a massive collapse. It could not be anything else. The physiotherapist will soon put her right. I do not think I shall have to bronchoscope her."

Having been house physician to Dr. William Pasteur at the Middlesex Hospital a few years after he first described massive collapse of the lung, I knew something about the condition, and I was sure that there was no massive collapse in this case. The X-ray film taken soon after-

wards confirmed my view. It was probable that the decortication of the pleura had liberated toxins into the general circulation which produced this severe infection. I have seen this take place after decortication in chronic empyema and it may prove fatal. The alternative view was that a spread of infection had occurred in the lower lobe or into the pleural space. In any case the services of the physiotherapist or bronchoscopy could only do harm and might prove fatal. Subsequent events indicated that the pleural space was infected, and eventually an infected blood clot formed at the amputated apex of the lung.

I left the room with a sad heart, fearing my patient was dying, and the next day set forth on my holiday; many times during the next three weeks my thoughts turned to her bedside as I wondered what I should find on my return. Almost as soon as I was home the Sister telephoned to say that June was to be operated on again the next day and she wanted to see me as she held on to me like a rock.

When I went into her room I found a scene very different from my last visit. June was sitting up in bed, her normal pink complexion had returned, and, apart from a noticeable thinness of the face, she was looking very well. The chest had been aspirated several times, and the temperature was now normal. The X-ray film showed two fluid levels over the upper part of the left lung, and it was proposed to do an upper thoracoplasty to close the space above the lung.

At the operation the second, third, and fourth left ribs were resected, together with a portion of the lower part of the scapula, and the infected blood clot removed. I saw the patient the following day, she was in much pain, and spoke in a weak and listless manner. Her brown eyes were dull and her cheeks had once more lost their lovely bloom.

A few days later there was considerable improvement, June's chief complaint now being of pain in the left shoulder and arm, with weakness in abduction and elevation. The sedimentation rate of the red cells was very high, 65 mm. plasma/1 hour (Westergren). A week later the reading fell to 45 mm. and the power of movement was returning in the left upper arm. The temperature was now reaching 99° F. in the evenings and there was no cough and no sputum. June was looking and feeling very well

“And in her cheeks the vermeil red did show
Like roses in a bed of lilies shed.”

Early in September, ten weeks after the thoracoplasty, June left hospital. There was still X-ray evidence of air and fluid in the space above the lung. When I said goodbye I added, “No more refills now. I shall not see you at Wimpole Street.” She replied, “I shall come by habit.”

Interlude

I did not see June again for two months, she was now up four hours a day, but was bringing up a little sputum and had considerable pain on moving the left arm. The X-ray film of the chest showed a small, triangular air space in the left mid-zone, which the surgeon considered to be outside the lung, the air probably coming from the alveoli, after the decortication. Early next year there was a slight improvement, but, somewhat unwisely, I thought, she and her husband had arranged to go for a holiday to Italy. They were both trying to live now as if there was nothing the matter, as if the long illness was a thing of the past, to be completely forgotten.

“If you have tears, prepare to shed them now.”

On their return in March June was much worse, the holiday had done no good. For the first time she was wheezing practically all day, even when sitting in a chair. She could not lie on her back or on her left side owing to difficulty in breathing, and there was much cough and sputum. The sputum contained tubercle bacilli and the temperature was reaching 100° F. in the evening. Tomograms showed no signs of cavity in the left lung, but there was evidence of a calcified focus in the left base, a calcified mass in the left root area, with infiltration in the left upper zone. When I told the husband the result of the investigations he said, “The operation has failed.” June went home to bed and began a course of iso-nicotinic acid hydrazide, mg. 100 twice daily, and in a week the temperature fell to normal and the sputum dried up. The appetite improved and when I next saw her in June she was much better and could breathe more freely. She said, “I feel like a new woman. I was very ill when I last saw you.” The husband seemed very pleased, was smiling and saying how much better she was.

I feared a relapse, and “relapses are the worst disease.” I next saw June three months later, in September. On discontinuing the iso-nicotinic acid hydrazide the cough and sputum returned, and now the tablets failed to work. June was again very depressed, saying “I am no better than before the operation.” The husband, perhaps as a policy of despair, told me he had decided to take his wife to South Africa for the winter. June was away for five months, and when I saw her on her return in March 1953, she had lost 6 lb. in weight, was running a temperature of 99° to 100° F. each evening, and had cough and expectoration. She was very depressed, hardly speaking, she seemed almost ashamed of her illness and of her failure to respond to treatment, her face was thin and her cheeks a little cyanosed, and, to add to her discomfort, she was a month pregnant. Over all these years I had come to admire the spirit of this unfortunate sufferer.

She complained very little in words when each setback occurred, and it was by her manner and voice on entering my consulting-room that I was able at once to tell whether she was on the upward or downward slope.

The X-ray film of the chest showed fresh infiltration in the upper zone of the right lung. The cheerful, hearty husband could not understand why the right lung had gone wrong again, and as June went down my front door steps, she looked back at me with sorrowing apprehension in her lovely soft brown eyes, for she undoubtedly realized the gravity of her condition. The pregnancy was terminated shortly afterwards and as a last hope it was arranged for her to go to a sanatorium in Switzerland.

June's reactions to this period were as follows:—

“After my operation, on which I had pinned all my hopes, everything was fine and I did not cough at all. You can have no idea the sheer heaven of going day after day without having to cough once, and it must be bliss to the people with whom one is living not to hear it. Unfortunately a few months later it began again. It was so disappointing, but it was winter and I thought it might improve with the better weather. In April I had a high temperature for about two weeks, and my sputum was also stained. I have often noticed that if my temperature is high my sputum is stained, and as soon as my temperature goes down my sputum is back to normal. When I took the I.N.A.H. pills my sputum dried up and my cough went, and then suddenly they stopped working and I was back to where I started. I felt so disillusioned, it would have been better in a way, if they had not worked at first. I was now very unhappy as I was getting more sputum and more cough than I had before the operation. Oh, I know the operation was necessary and it was successful and I am very grateful, but I had pinned such high hopes on it that I found it difficult to reconcile myself to the fact I was no better.

“Anyhow we decided to miss the winter in England that year and go to South Africa and see if I would be any better. We reached Cape Town at the end of October and the weather was pleasantly warm, but not hot. We stayed there for six weeks during which time I literally did little else but sleep and eat and laze around, just going by car to see various places of interest. I met many people who suffered from bronchitis who came from England and they maintained that after about a fortnight of South Africa their coughs disappeared, so I sat down happily to wait. Of course my cough did not go, but I do think it seemed to get better. I still coughed in the morning, but in the afternoon and evening I hardly seemed to cough at all, and I certainly never woke in the night coughing. I was feeling very well and much more hopeful. From Cape Town we went to a little fishing

village called Hermanus where we stayed a fortnight. Here we just pottered around and I rested every afternoon until tea-time. We also had the finest food anywhere in our travels, so I should have been well.

"On December 20th we left to go to a place outside Knysna. It is a sort of summer residence which is just used when the owners feel like it or at holiday times, it is about 300 miles out of Cape Town. The house felt dark and cold, I loathed it on sight. As it had not been used since the previous Easter the beds were damp and I could not air them because it had begun to rain. There were no modern conveniences and the lavatory was out in the forest somewhere. I named it the snake-pit, because you had to be careful of snakes on the way. I do not mind Spartan conditions in the ordinary way, but somehow I loathed the place. I had not been there more than a day before I felt I could not breathe. The trees at the back came right down to the house. I like trees ordinarily but these were different. They were heavy and hung with creepers so that you could not see through them, you felt you were being smothered. In front of the house was a "lagoon," not as you would imagine one, or as I did before I came to the place, as a lake of blue water, but a sort of muddy river. When you went down it in a rowing boat, it was not very deep; it was an eerie experience because the forest came down to the banks on either side and was quite impenetrable, with a deathly hush hanging over everything, not even a bird call being heard. It gave me the shivers.

"After the second day, I began to feel rotten and my breathing really was worse, as I was full of phlegm. My cough naturally increased and I began to run a temperature. I think a lot of this was due to climbing up the wretched mountain, although I did this as little as possible, in fact only twice, except on leaving. My temperature was around 101°-102° F. most of the time I was there, and again my sputum was stained. I must have had the temperature for about fourteen to sixteen days. I was very glad to leave on December 29th, when we made for Port Elizabeth.

"I was still running a temperature and coughing, but not so much. After another week my temperature dropped and I began to feel better, and my cough was not so bad. From Port Elizabeth onwards we were climbing all the time and mostly we were up around 3,000 to 4,000 ft., so the atmosphere generally was much drier. From Johannesburg we went on to the Falls in Rhodesia and then back to Kruger Park, and on down to Durban. All this time I had kept well although I still coughed. Now I realized that South Africa was not going to make me any better. I think I had become more or less resigned to the fact that I would not get any better, and hoped I would not become any worse. What I could not get used to was the frustration of not being

able to do what other people were doing, or even what I would like to do myself, and to hear my husband having to make excuses for me. It is not so bad when it is only for a short time, but when it goes on for year after year it is demoralizing. What is worse, I look so much more healthy than most other people, so that they find it hard to believe there is anything wrong with me. I think that has been half the reason for my still having this wretched disease, because, as I look well and have a good colour, people expect more of me than I am capable of giving, and, in desperation, I have done things I know I should not have done. If I had been pale and thin, people would have said, 'Poor thing, she does look ill,' and left me alone.

"On my journey home I was all right the first few days on the ship, but as it started to get progressively hotter as we neared the equator, I began to feel rotten. I started to run a temperature again and I also began being sick, which of course did not help at all."

Switzerland

June arrived at the sanatorium in Switzerland at the end of April 1953, and five weeks later the superintendent wrote to tell me that she was making good progress, and, owing to her intolerance to P.A.S. when taken by mouth, it was being administered by intravenous injection. The tomograms indicated that there were infiltrative changes in the right upper lobe with very small destructive spots, and two small cavities in the upper part of the left lung. The films were sent to me and were very similar to the last ones taken in England. One of the translucent areas in the left upper zone appeared to be a bronchus and the other due to air outside the lung, which had considerably absorbed in the interval.

June wrote to me, and, after complaining of the cost of the drugs, added, "Anyhow the air is fine. I am in bed, but this I expected so am not disappointed. In any case I should probably get too restless if I were up, and would want to come home."

Three weeks later the sanatorium report was more encouraging. There was considerable improvement and recovery was hoped for. I had no further news from Switzerland until December 1953. June had done very well, but during the previous two weeks had developed bronchitis. The shadow in the right upper lobe was smaller, the temperature was normal, but the sputum still contained tubercle bacilli, and the sedimentation rate of the red cells remained at 26 mm. plasma/1 hour. Four more months elapsed before I received the next report, in April 1954. The tomograms were said to indicate active trouble on the left side, and a month later I was informed that an extrapleural empyema had developed which was communicating with a bronchus. A surgeon who had been called in had inserted a drainage

tube, and this was to be followed by rib resection. Shortly afterwards I was visited by the patient's sister who had been to the sanatorium. She said that June was anxious to stay in Switzerland and felt she would get well if allowed to remain there. She added, "She does not complain, and she has never done so throughout her long illness."

Tuberculous empyema is a grave complication of lung resection, and what would be the end of this tragic story I could not say. I could only ask

"Why, Disease, doest thou molest
Ladies, and of them the best?"

In November 1954 I received another report from Switzerland. The operation had now been performed. It was found that the empyema had perforated into the lung and the purulent sputum was originating from the empyema. The perforation hole was closed and the thoracoplasty was completed without any further lung resection. The physician wrote that he hoped that June would make a complete recovery in the spring or summer of next year.

Her husband, who had been out there at the time of the operation, told me that she had been desperately ill after the operation but her courage remained unabated and she was full of hope for a complete recovery. Despite these hopeful reports she died eight weeks later.

* * * * *

There is another trial to which some young tuberculous patients are subjected, and that is parental over-anxiety. This may be so pronounced as to interfere seriously with the patient's treatment or convalescence, and even to threaten a rupture in his married life. Here are two examples:—

Georgina. Aet 18. Student.

This girl returned from a holiday in the South of France one August. Her mother said that she caught a chill there owing to not wearing enough clothes. A month later Georgina shivered and noticed pain in the left side of the chest. The temperature rose to 103° F. and a consultant was called in who made a diagnosis of virus pneumonia. No satisfactory response being obtained with the routine treatment of chloramphenicol and aureomycin, an X-ray film was taken which revealed the presence of a pleural effusion. The patient then came into hospital under my care, and guinea-pig inoculation and culture of the fluid showed tubercle bacilli. She did very well with a course of injections of streptomycin, the fluid absorbed, and subsequent X-ray films of the chest showed no evidence of pulmonary tuberculosis. On leaving hospital Georgina went to a convalescent home for

two months and returned feeling very fit. I saw her subsequently, at first every two months for a year, and then at longer intervals. Her mother always came with her and exhibited the greatest anxiety and vexation of spirit. She complained that her daughter did not wear enough clothes, that her heart beat loudly when she was lying down, and that she did not consider it wise for her to go out in the evenings to the theatre or to an occasional party, as she was so easily fatigued. The whole attitude of fussiness and parental worry threatened to render the daughter a permanent invalid.

The girl was engaged to be married, and had been engaged before the onset of the illness. She now naturally wanted to go out with her fiancé, but gradually became so obsessed by the necessity of taking extreme care of herself that she was frightened of doing anything which might involve a little extra fatigue.

The wedding took place two years later, and, after returning from the honeymoon, her husband brought her to see me, and this time without her mother. The bride said she felt "fine," she looked well, the X-ray film was perfectly satisfactory, and I hoped that she no longer regarded herself as an invalid. The husband then asked to speak to me alone. He said he was very concerned about the state of his wife's health. He told me that she behaved as if she were a complete invalid, and before they went away for the honeymoon abroad his mother-in-law gave him a list of instructions he was to observe. I asked what these instructions were, and he replied, "How long Georgina was to be in bed each night, how far she could walk, and how important it was that she should not bathe or be exposed to the sun." He went on to say that after her illness, and before their marriage, if he took his fiancée to a dance once in two weeks, she would only dance once in the evening. If he suggested a ride in the car she said she felt sick and wanted to return home after half an hour. If they went out sight-seeing she could not walk up half a dozen stairs.

When they first began home life after the honeymoon his wife rose to prepare the breakfast at 8 a.m., but, after a few mornings, she said it was too much for her, as she should not get up before half past nine. For the first few days he came home at midday, until his wife nearly had a nervous breakdown owing to the effort of preparing the lunch.

The husband emphasized that he wanted to do everything he could for his wife, and added that he did not break off the engagement when she became ill, although advised to do so by many of his friends. He wanted now to know whether she was such an invalid as her mother appeared to believe. If that were so he would do all that were necessary to protect her health.

I assured him that Georgina could safely do a great deal more

now, that she should be encouraged to go out with him from time to time, and that she should not be treated as an invalid. It appeared to me that the mother's excessive anxiety lest her daughter's health should break down involved an even greater risk of a breakdown of the marriage.

Christopher. Aet 20. Living at home.

This young man had been leading the life of an invalid for over five years when I was first asked to see him. While at school at the end of 1948, a routine mass miniature radiographic examination was carried out, and he alone was found to be affected, although feeling in perfect health. For a schoolboy to be told under these circumstances that he is suffering from a serious disease of the lungs must come as a great shock to the nervous system, even to the most phlegmatic.

The X-ray film showed evidence of tuberculous infiltration in both upper lobes, and the sedimentation rate of the red cells was raised to 26 mm. plasma/1 hour (Westergren). Christopher was taken away from school and treated in a somewhat desultory manner, with periods of rest in bed at home, interspersed with visits to the country or seaside. He was also sent twice to sanatoria, once in Switzerland and once in England, and was given courses of injections of streptomycin combined with para-aminosalicylic acid by mouth.

I first saw this very pleasant and sensible young man in the summer of 1953, when he told me that he felt perfectly well but, at varying intervals, he was said by his doctors to be ill, and he was then sent to bed for an indefinite period. "I never feel any different," he added, "when I am supposed to be well and when I am told I am ill," and he was becoming very cynical about the wisdom of the medical profession.

I made my clinical examination and looked at the X-ray films. There was no doubt that there was now a thick-walled cavity, half an inch in diameter, in the left upper lobe. In the 1951 film this lesion appeared as a solid mass, but in November a small area of translucency could be seen in its centre. Some of the lesions in the right upper lobe showed evidence of calcification.

In this case the boy's father was the parent, who, by his ill-concealed over-anxiety and irritating insistence on comparatively unimportant details of treatment, added to the tribulations inherent in the disease.

I advised that Christopher should come into hospital in London, with a view to resection of the upper lobe of the left lung, or a part thereof. A segmental resection, with removal of the cavitated area, was successfully performed, the remainder of the lung expanding to fill the space. There were no complications, everything went off very smoothly, and a month later the patient was transferred to a

sanatorium for convalescence. He remained there for eight months, gained a stone in weight, was able to walk two miles a day, and was described by the superintendent as "an excellent and co-operative patient throughout."

On returning home his father brought him to see me again, to discuss the immediate and distant future. The X-ray film now showed no evidence of tuberculosis in the left lung, and the lesions in the right upper lobe appeared slightly more calcified. The dominating manner in which his father spoke to him, such as telling him to sit down or stand up, made me feel most uncomfortable and sorry for the boy. The question of milk came up once more, for Christopher had an intolerance of milk. He had been forced to drink so much during the early stages of his illness that he regarded milk drinking as indicative of disease. He would not take it in tea or coffee, and only in minute amounts on cereals. His father rang me up several times and urged me to "give him a good talking to, and tell him he must take milk." We discussed the future, and the father said his plan was that they should go for a motoring holiday abroad, and on returning his son should start work in his business, at first for two to three hours a day. I was opposed to the motoring holiday and wondered whether Christopher wanted to go into his father's business, and so I enquired, "What do you want to do in life?" He replied, somewhat resignedly, "I am to go into my father's business." He had no apparent enthusiasm for this, but he was trained for nothing else, owing to the six years' illness beginning before he should have left school.

I advised that he should not go abroad, but should take a quiet holiday, away from his parents, in England for two or three months. He was a sensible patient, not likely to overdo things, and did not mind going alone to a hotel. This would form an intermediate step between leaving the sanatorium and returning to home life.

I now tried to encourage Christopher that he would become quite fit, after his long illness. He looked at me with a whimsical smile and said, "You should treat my father and persuade him I am not in danger of an immediate breakdown."

RESUSCITATION IN CONGESTIVE FAILURE

*“ Death in itself is nothing, but we fear
To be we know not what, we know not where.”*

AURENG-ZEBE

I HAVE read recently in a medical journal that the treatment of congestive failure has improved very much during the last twenty years, and I do not think that anyone would take exception to this statement.

The discovery by Withering, in 1785, of the wonderful diuretic effect of digitalis in cases of heart failure and its action upon the heart is one of the outstanding achievements in therapeutics. Had the virtues of the purple foxglove been fully known, even one or two years earlier, Samuel Johnson's life might have been considerably prolonged, for he died at the age of seventy-five, on Monday, December 13th, 1784, at about seven o'clock in the evening.

The main-stays of treatment in cases of congestive failure, just previous to the discovery of digitalis, were opium, squills, and incisions in the legs to drain away the fluid.

Samuel Johnson's "asthma" was probably cardiac asthma. His fatal illness began early in 1784; it was followed by a remission in the spring and early summer when the breathing improved and the œdema lessened, only to be succeeded by the relapse, in the autumn, which proved fatal. During September 1784 Dr. Johnson wrote to Dr. Brocklesby, "The nights are still sleepless and the water rises, though it does not rise very fast. . . . The squills I have not neglected; for I have taken more than a hundred drops a day, and one day took two hundred and fifty, which according to the popular equivalence of a drop to a grain, is more than half an ounce." Early in October he wrote, "Of the dropsy, in the beginning of the summer and in the spring, I recovered to a degree which struck with wonder both me and my physicians: the asthma now is likewise, for a time, very much relieved. . . . The dropsy has made two attacks, and has given way to medicine; the asthma is very oppressive, but that was likewise once remitted. I am very weak, and very sleepless; but it is time to conclude my tale of misery."

In November Johnson wrote, "I am as I was, but having seen Dr. Brocklesby, am to ply the squills; but, whatever be their efficacy, this world must soon pass away." In his last letter to Boswell, written on November 5th, 1784, we read, "My legs are extremely weak, and my breath very short, and the water is now encreasing upon me."

Later Boswell wrote of Johnson, "Imagining that the dropsical collection of water which oppressed him might be drawn off by making incisions in his body, he, with his usual resolute defiance of pain, cut deep, when he thought that his surgeon had done it too tenderly."

A week before his death Johnson said to Mr. Toole that when he recovered in the previous spring he had only called it a reprieve, but that he did not think it was for a longer time. The end came peacefully on December 13th, "with so little apparent pain that his attendants hardly perceived when his dissolution took place." Mr. Francis Barber, his faithful negro servant, and Mrs. Desmoulins, the widow of a writing-master who lived in his house and to whom he allowed half a guinea a week, were in the room with him and "observing that the noise he made in breathing had ceased, went to his bed, and found that he was dead."

The advances in the treatment of congestive heart failure are first the use of organic mercurial diuretics, such as Mersalyl, with or without the simultaneous administration of ammonium chloride, and secondly the reduction in the salt and fluid intake. A diet which contains not more than mg. 250 to 500 sodium and a fluid intake limited to 35 or 40 oz. in the twenty-four hours usually reduces œdema and, in cases of hypertension, lowers the blood pressure. Mersalyl does not produce a diuresis in all cases; if it is effective the amount of urine passed often rises to about five pints in the twenty-four hours following the injection, but during the next day the output usually falls to rather less than the average flow when no Mersalyl is injected. The injections are often required once a week and may be continued for prolonged periods, if a satisfactory diuresis is obtained. The loss of fluid is reflected in the patient's fall in weight, often a stone or more, and eventually he becomes dehydrated. This, if not relieved, leads to malaise and weakness, so that, although the patient may be able to be up and about and to do a certain amount of work, life becomes wearisome. Many a victim of congestive failure puts up a brave fight against the repeated onslaughts of the foe, knowing that he must eventually be defeated. "I will be conquered, I will not capitulate," is his watchword.

With the use of these therapeutic measures there may be as many as four or five reprieves before the fatal attack is delivered. In each relapse the response to treatment is less marked and the intervals between the assaults usually become shorter.

Have the sufferers from congestive heart failure really benefited by these advances in treatment? Is it kind to rescue the patient from the pangs of dying three or four times only to fail when the inevitable final onslaught is delivered? These and other questions may be worthy of reflection.

The Musician

One day, during the last week of August 1934 I was called out urgently to see a patient living in one of the London suburbs, on account of a severe attack of palpitations.

He was a man, fifty-five years of age, who had noticed similar, but slighter, attacks of palpitations during the preceding months of May and July. Before this his health had been very good and there was no history of a rheumatic infection. When I arrived the palpitations had abated, but I found a condition of slow auricular fibrillation, with signs of congestion at the base of the left lung. There was no engorgement of the liver and no œdema of the legs, the peripheral circulation, however, was poor, the hands, feet and legs being cold and blue. As the patient looked very ill I arranged for his admission to hospital the same day.

On visiting Mr. C. in the evening I found him propped up in bed, gasping for breath, cyanosed, with an apex rate of 190 a minute, although the pulse was recorded on the chart as 96. The heart was still fibrillating and the lungs were more congested. Under the influence of digitalis there was a rapid and steady improvement, the apex rate fell to 96 during the next forty-eight hours, and a regular rhythm was restored in a week with relief of all signs of heart failure. The blood pressure settled down at 170/100 mm. Hg. The heart was enlarged, with an apical systolic murmur, and there was no evidence of renal failure. The condition was one of hypertensive heart disease.

Mr. C. was a musician of outstanding ability, occupying an important position in London. Physically he was well developed and tall, 6 ft. in height, and weighing just over 12 st. in his clothes. He was bald, with a grey fringe of hair, his face was long and oval with high cheek bones, a malar flush and congested lips and ears. Temperamentally he was gentle, refined and very sensitive, with a pleasant soft voice, and as his condition improved I often found him reading music scores at my visits.

Two weeks after admission the patient was able to get out of bed, and after a further fortnight in hospital Mr. C. was up five hours a day, walking along the corridor, and the digitalis was now discontinued. I advised him not to undertake any musical engagements for a few weeks, although he was very anxious to return to work.

The auricular fibrillation recurred periodically, but was easily controlled with short courses of digitalis, until a second attack of congestive failure, in the middle of January 1936, necessitated readmission to hospital. This relapse was considerably more severe than the previous illness, and at one time it seemed likely to prove fatal. In addition to the signs of right- and left-sided cardiac failure a succession

of pulmonary thromboses developed, each one resulting in severe shock, collapse and Cheyne-Stokes breathing. There were also episodes of violent coughing in which the patient feared he would choke. Eventually a favourable response was once more obtained with digitalis, and after three months' stay in hospital Mr. C. was able to go home taking a daily maintenance dose of digitalis. For the second time he had made a good recovery and could walk on the level, but I advised that he should do no work for another two or three months.

During the summer of this year Mr. C. had so far recovered as to be able to conduct at a few concerts and engage in musical work at home. I saw him from time to time; the fibrillation persisted, he was leading a very restricted life, taking short walks in the garden, resting lying down in the afternoon, and retiring to bed early in the evening. There were occasional attacks of shortness of breath but he suffered no pain or real distress.

Early in September 1936 I was asked to see Mr. C. again as he was not sleeping so well and the breathing was more laboured. I found then no signs of heart failure, and the apex rate was 80. Five days later, however, he was admitted to hospital for the third time with severe cardiac failure. The apex rate was 106 a minute, the auricles were fibrillating, and there was congestion of the bases with sacral œdema and dyspnœa. He now remained in hospital for nearly seven months, until April 1937. Treatment comprised digitalis by mouth, intramuscular injections of an organic mercurial diuretic, Novurit, and a salt-poor diet, but recovery was very slow. The response to Novurit was good, the average output of urine during the twenty-four hours after an injection being 150 oz. of urine.

On leaving hospital Mr. C. retired to a country house and lived very quietly. He took breakfast in bed, was up from 10 a.m. until after lunch, slept on his bed during the afternoon for two hours, and retired to bed at 10 p.m. He was able to walk in the garden and a little way along the road, but he did not go upstairs at all. He was contented and happy and did a little music writing and editing. Apart from a few ups and downs all went well during the remainder of the year.

A year after leaving hospital Mr. C. wrote to me: "I am still having weekly injections of Novurit. I am leading a very quiet life with little exertion, and do some brain work, but not too much. I stroll about our small estate. Generally speaking I feel very well and understand my appearance belies my condition. I am content to go on like this and watch my younger colleagues carry on the rather strenuous work that has bowled me over so effectually."

I heard no more until April 1939, two years after leaving hospital, when his wife wrote that he was "well enough to write, but lacked that

extra energy which makes it an easy matter. He had another 'climax' about two weeks ago, but has recovered from it amazingly, and, although still taking things quietly, he is very cheerful, not at all breathless and he has a very healthy appetite." A month later he died, following a series of pulmonary infarcts, four and three-quarter years after the first attack of cardiac failure.

Mr. C. was temperamentally placid and contented, blessed with a good wife, who looked after him assiduously, and possessed of sufficient means to live quietly in the country; further, he could relieve the monotony of an invalid's existence by his own mental resources, writing, reading or editing music, for music is "an infinite treasure to such as are endowed with it."

This patient's life was undoubtedly prolonged, thanks to the newer methods of treatment, and I believe that, had he been asked to choose, he would have wished for the postponement of the inevitable which resulted from their use.

The Spinster

This lady, unlike the previous patient, had been much afflicted by illness in the past. When I was first asked to see her she was sixty-two years old, and during the last twenty years had undergone four major abdominal operations at intervals of approximately two years. These included appendicectomy, removal of both ovaries, extirpation of a growth adjacent to the uterus, and resection of 14 in. of the colon. In addition, on several occasions the bones of the legs had been incised in an attempt to relieve the pains due to Paget's disease.

Miss B. consulted me early in 1935 on account of palpitations, when I found that she was suffering from hypertensive heart disease, the heart being enlarged and the blood pressure raised to 208/112 mm. Hg. The urine contained a trace of albumin but no sugar. I prescribed a mixture containing a small dose of bromide which quickly relieved the palpitations, and the patient felt much better.

Small of stature, just 5 ft. high, but plump, weighing 9 st. 6 lb. in her clothes, she was always dressed demurely in black. Precise in appearance and speech, she was pale with a freckled face, small, clearly cut features, and pince-nez perched somewhat precariously on her nose. Her hair appeared dark brown and plentiful, but I discovered on a subsequent visit that she wore a wig.

I saw this patient several times each year subsequently, and she remained in fairly good health until the spring of 1940 when, being much troubled again with palpitations, she was admitted to hospital for a short rest. I noticed later that during the summer, especially if the weather was hot, Miss B. would lose nearly 2 st. in weight with

a corresponding fall in blood pressure, from about 210 mm. Hg. systolic to 150 mm. Hg. From time to time I listened to complaints of "a dreadful pain in the heart, going down the left arm," and a favourite remark was, "I feel as if I could take hold of my heart and hold it up." The pain in the bones of the thighs was also severe from time to time, with a feeling that the thighs themselves were going to burst. In the cold weather Miss B. said that her heart felt "like a leaden ball," and she experienced queer heart turns, both by night and by day, in which she felt that the heart was "collapsing."

A more definite deterioration in her health began shortly after the onset of the air-raids, owing to the difficulties of the black-out, and to the apprehension and loss of sleep resulting from them. It was now that the first signs of congestive cardiac failure were noted—swelling of the legs, and the heart beat became more forcible. In October 1940 the raids were more frequent, and although Miss B. said she was standing them very well, she became subject to attacks of paroxysmal tachycardia.

During 1942 there was a further deterioration in her health, accompanied by a great feeling of oppression in the chest, "as if it had been beaten." About this time the liver became swollen, congested and tender. I advised Miss B. to go into a local nursing home for a rest, which she did for two weeks, with some improvement. However, when I saw her a month later she was not so well, the dyspnoea on walking was more noticeable, and the palpitations were very troublesome; and a few months later signs of left ventricular failure were pronounced, with cardiac asthma and an apex rate of 160 beats a minute.

Conditions were then very harassing for an invalid living alone in London; shopping involved standing for long periods in queues, and, as soon as darkness fell, the sirens sounded and we were transported from a world of comparative peace to one of raging terror. All night long the anti-aircraft guns boomed, and the bombs came whistling by, exploding with deafening thuds. Many slept, or tried to sleep, on a mattress in a ground-floor room, often under a table, and the floor could be felt to rise and fall with the blast from the exploding bombs. "They heard the tumult and were still." And then, with the advent of the first streaks of dawn, the noise would suddenly cease, and the weary watcher would try to snatch a few hours' sleep before returning to his daily task.

Later in the war, with the advent of flying bombs and rockets, there was no longer the hope of peace by day. At any moment, when out shopping or riding in a 'bus, some frightful missile might suddenly drop from the skies, scattering death and destruction around. Such surroundings were the worst possible for a patient suffering from heart

disease, and yet Miss B. continued to live in London during the war, her only tie being, as far as I knew, her affection for her goods and chattels.

The patient was admitted to hospital with the second attack of congestive failure in August 1942. The auricles were now fibrillating. She was treated with a low salt diet, digitalis, and a fluid intake limited to 30 oz. in the twenty-four hours. No mercurial diuretic was employed. The clinical response was rapid, the signs of congestive failure quickly disappearing, but Miss B. never appeared to recover completely from the effects of the dehydration. The weight had fallen to 7 st. 11 lb. on leaving hospital, a loss of 12 lb. in a month, and she continued to lose weight for the next eighteen months until, in May 1944, despite increasing the fluid intake to 40 oz. in the twenty-four hours, the weight was only 6 st. 8 lb. During all this time Miss B. appeared feeble and ill, her face was thin and pale—she was in fact a shadow of her former self and looked as if a puff of wind would blow her away. The fibrillation persisted, and although there was no swelling of the legs and no congestion of the lungs, she had difficulty in doing her housework and shopping, on account of extreme weakness. It seemed that the fluid balance had been tipped too far in the process of dehydration, and equilibrium could not be restored. During the autumn, however, the balance swung in the opposite direction, there was an increase of 20 lb. in weight in a few months, only to be followed once more by cardiac asthma. Miss B. came into hospital again with congestive failure in November 1944 and at the same time suffered an attack of subacute glaucoma. Once more a satisfactory result was obtained with treatment, the signs of cardiac failure disappeared, and now, to my relief, she agreed to leave London and retire to a nursing home in the country where she could be carefully tended. She was very happy there, but the fourth and final attack of congestive failure was only delayed until the following spring, five years after the first signs of cardiac failure had been noted.

I feel that this patient derived little satisfaction or pleasure from the prolongation of her life which resulted from the “advances” in treatment. She was alone and had none of the consolations afforded by a close relation or an attentive companion, by affluent means, or by a well-stored mind. She was very plucky and insisted on looking after herself as long as it was possible, although she could have resigned herself to an invalid's existence in a home several years earlier.

The Housewife

I first met Mrs. M. when she was admitted to hospital under my care on account of congestive failure in June 1947. She was then

fifty-three years of age and the mother of two healthy children. Her husband was also alive. There was no history of rheumatism and Mrs. M. had been very well until a flying bomb partly demolished her house in 1944. She was in the house at the time, but escaped without obvious injury. It was shortly after this terrifying experience that she first noticed shortness of breath on walking, and this gradually became more severe. She had attended another hospital as an out-patient in 1945 on account of her heart and had been admitted for a short time because of palpitations, auricular fibrillation and aortic incompetence, although there was then no indication of congestive failure. The condition was one of hypertensive heart disease.

When I examined Mrs. M. in hospital in June of 1947 she complained chiefly of attacks of shortness of breath at night. She would wake suddenly, about two hours after falling asleep, with a feeling of suffocation and impending death. She would then sit up, sweating profusely and fighting for breath. She would get out of bed and stand by the open window, and, after about fifteen minutes, the attack would pass off, leaving her exhausted.

Mrs. M. was only comfortable in bed when lying propped up. She was of slight build, 5 ft. 5 in. in height and weighing 7 st. 11 lb. She was thin, pale, with a malar flush, restless and anxious looking. There was cardiac enlargement, aortic incompetence, auricular fibrillation, a high blood pressure, 225/110 mm. Hg., a collapsing pulse, œdema of the bases of the lungs, a small, left hydrothorax, engorgement of the cervical veins, œdema of the ankles and sacrum; indeed a classical picture of right- and left-sided cardiac failure. After reverting to the eighteenth century treatment of venesection, 15 oz. of blood being removed from a vein in the arm, the routine twentieth century treatment was adopted, restricted fluid intake, low salt diet, digitalis, injections of Mersalyl, oxygen inhalations and injections of morphine at night. There was a rapid improvement, the blood pressure fell to 170/75 mm. Hg., the weight to 7st. 3 lb., and the patient returned home after a stay in hospital of seventy days, walking about and with no evidence of congestive failure.

I was next asked to examine Mrs. M. in January 1948. She was feeling very ill, short of breath on slight exertion and sleeping badly. The weekly injection of Mersalyl made her feel even more ill. She was getting up about 9.15 a.m., pottering about the house, doing a little housework and cooking, lying down for two hours in the afternoon, and going to bed about 9 p.m. The blood pressure had risen again to 260/104 mm. Hg., and the veins in the neck were engorged, with the patient lying at an angle of 45°. I advised a week's complete rest in bed at home, but she said this was quite impossible, as there was no one to look after her, her husband was out at work, and she

was quite alone. The condition rapidly deteriorated and Mrs. M. was admitted to hospital with congestive failure for the second time in April 1948. She again made a good response to treatment and and returned home after a stay of sixty-three days.

Six weeks later she was back in hospital again, with extreme dyspnœa, swelling of the legs and ankles, œdema of the lungs and attacks of cerebral anæmia, in which everything went black and she felt very faint. She now weighed only 6 st. 8 lb. and was very depressed; her nights had been appalling, she would wake five or six times struggling for breath, and when the morning came would fall, exhausted, into a more peaceful sleep. Once again a fairly satisfactory response was obtained with treatment and Mrs. M. left hospital after a stay of fifty days. For the next eight months she was at home, resting as much as possible, doing what housework, shopping and cooking she could manage, and then, in May 1949, I was asked to see her again. She told me that her legs were now perpetually swollen, and at night they felt very tight, especially around the right ankle, as if the skin was going to break. The injections of Mersalyl always made her feel very ill and did not cause any definite increase in the output of urine. She was very depressed indeed and told me she did not want to live. I arranged for her to be admitted to hospital for the fourth time, four days later, and again she rapidly improved with treatment and left after a stay of fifty-six days. She was now much more cheerful and said that she had not felt so well for over two years.

Six weeks later, however, she was re-admitted; this time chiefly on account of nausea and hæmaturia. The latter was due to a Bact. coli urinary infection which rapidly responded to injections of streptomycin, and the patient went home two weeks later.

After another ten weeks Mrs. M. was admitted to hospital for the sixth and last time. This was in November 1949. It was evident now that the forces of death had the upper hand and nothing further could be done to defeat them. The œdema rapidly spread so that both arms became very swollen and painful, and there was also ascites. No response was obtained to Mersalyl. Eventually the patient was nursed sitting up in a cardiac chair, so that the fluid could drain into the legs. She complained bitterly of the tension in them. Southey's tubes were inserted around each ankle and left in for three days. The fluid continued to drain from the ankles for three weeks after they were removed. We had therefore to recourse once again to the treatment in vogue in Samuel Johnson's days, the newer methods having failed.

Dr. Reginald Southey invented his tubes about 1879. He was an Oxford graduate and a physician to St. Bartholomew's Hospital, London. He was a nephew of the Poet Laureate.

Mrs. M. left hospital on February 18th, 1950, after a stay of one

hundred days. She was still water-logged and helpless, and the end could not be far off. She died early in May.

This patient would not have lived so long had she not frequently been admitted to hospital,—in the intervals she was so ill that she had no desire to live.

Do you think that she benefited by the advances in treatment?

IDLE THOUGHTS

Homolateral dilatation of the pupil may be a sign of spontaneous pneumothorax.

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Alcoholic doctors attract alcoholic patients.

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Clubbing of the fingers, but not of the toes, may occur in Crohn's disease.

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A patient who is short of breath on talking is suffering from emphysema and not from asthma.

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Stilbæstrol enables a woman to change her life without regretting it.

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There is no such thing as a "clever" doctor. Doctors are either good or bad.

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I dislike a general practitioner who wishes to put his own words into the patient's mouth when the patient is describing his symptoms.

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Patients suffering from chronic uræmia often die suddenly and quite unexpectedly, and so a guarded prognosis should always be given.

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A patient with a duodenal ulcer has pain when his stomach is empty—after partial gastrectomy he has pain when his stomach is full.

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Women frequently complain to doctors about their husbands, but a husband seldom complains about his wife.

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True knowledge of disease must be had from disease itself, not from books.

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Physicians should soften the naked severity of science. .

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Physicians are sometimes asked whether a patient will stand an operation. A patient is never too ill for an operation if it offers the only chance of saving his life.

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Cases of pulmonary tuberculosis which heal by calcification, as shown by X-ray examination, usually do well and seldom relapse; those in whom healing occurs without calcification are liable to relapse.

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With an extensive coronary thrombosis the blood pressure may be so low that no urine is secreted, this is a very serious symptom.

Part III

CASES DEMONSTRATED AT THE BEDSIDE
BY QUESTION AND ANSWER

“ O, help thou my weak wit, and sharpen my dull tongue! ”

THE FAERIE QUEENE

A CASE OF ŒDEMA, VERTIGO AND BLINDNESS

THE patient in No. 5 bed is a single woman, forty-one years of age, until recently employed in the Civil Service. She was sent to see me, just two weeks ago, on December 2nd, 1952, by an eye specialist. He wrote as follows: "She first came to me on account of failing vision two years ago which was due to cataract formation. After a few months she developed a vitreous hæmorrhage in the left eye. I therefore operated on the right eye which was the more affected by cataract. The result of this was reasonably good, but retinopathy was found as soon as a clear fundus view could be obtained. About a year later this eye developed glaucoma for which I had to do an iridectomy. This episode accounts for the pallor of the disc. I operated on the left eye in May of this year. There are vitreous floaters from previous hæmorrhages. In March 1951 a course of streptomycin was given, which was quite short, and the dosage was, I understand, not heavy. She improved as far as the retinal hæmorrhages were concerned, but developed vestibular symptoms five days after the last dose of streptomycin, and these persist. I do not think much can be done to help this unfortunate patient, but if the giddiness and vomiting could be relieved she would be much happier."

When the patient came into my consulting room I was struck by her pallor. She walked unsteadily with the aid of a stick, and her legs were very swollen. Her vision was so much impaired that she could not clearly distinguish my features. For the last six weeks sleep had been much disturbed by breathlessness.

I enquired about the streptomycin, the course consisted of 1 G. daily for fourteen days. The swelling of the legs had only been noticed for two weeks. Owing to her weakness I did not make a complete examination, and she was not able to pass a specimen of urine. There was pitting œdema of both legs, thighs and back, extending up to the lower dorsal region. Her weight (clothed) was 10 st. 13 lb., the normal weight being 9 st. She thought she had gained this weight during the last few months. Screen examination of the chest showed cardiac enlargement, with a little pleural fluid, more on the right than on the left. I arranged for her immediate admission to hospital here.

I want one of you to examine her now. She is very ill, suffering from extreme nausea and vomiting from time to time. She is not in a fit condition to answer questions and if there is anything else you want to know about her history I will try and tell you. Just examine the front of the chest and abdomen, and legs, but do not sit her up or turn her over.

Dr. B. examines the patient while we look at some X-ray films. After twenty minutes we discuss the case in the centre of the ward.

Q. Well, Dr. B., what have you found?

A. She looks very ill. Her face is pale and swollen under the eyes. She is very apathetic and lies on her right side with closed eyes. There is œdema of the legs, right up to the groins. There is no ascites and I could not feel the liver or spleen. The heart appears enlarged, but there are no murmurs. The lungs are clear in front. The pulse is regular, 100. The blood pressure is 195/100 mm. Hg.

Q. What is the temperature?

A. I do not know.

Q. Here is the chart. The temperature has been subnormal since admission. Did you test the urine?

A. Yes.

Q. That is unusual. You must have been well trained. I suppose you were not one of my clerks.

A. No. I come from Barts.

Q. Ah, Barts! That explains it. Well, what did you find?

A. There is a thick cloud of albumen, but no sugar.

Q. What do you make of the case?

A. I think she has hypertensive heart disease, with right- and left-sided failure, and possibly renal failure. She has had bilateral cataract and probably hypertensive retinopathy.

Q. It is probable that the streptomycin was given on the assumption that the retinal hæmorrhages had an infective origin. What is the cause of the nausea and vomiting? This appears to have followed the streptomycin, and there have been three or four attacks a day, but sometimes she was free from them for two or three days.

A. This might be a toxic reaction from the streptomycin, or it might be due to renal failure.

Q. What else might cause the vomiting?

A. Digitalis.

Q. *To the H.P.:* Has she had any digitalis?

A. Yes, Sir. I gave her digoxin 0.25 mg. twice a day, but after three days I stopped it as I thought it might be making the vomiting worse.

Q. Did you find anything else, Dr. B., when you examined the front of the chest?

A. No.

Q. Well, you should have. There is a hard mass in the right breast and some small glands above the right clavicle. She has been examined by a surgeon and he has diagnosed carcinoma of the breast. What other investigations would you like carried out, Dr. B.?

A. The blood urea to see if there is any renal failure.

Q. This has been done. It was 174 mg./100 c.c. on December 4th. The blood sugar was also estimated. It was 87 mg./100 c.c. There is evidence of renal failure and probably of uræmia. What else would you like done?

A. Examination of the urine for casts and organisms and a blood count to see if she is anæmic.

Q. The urine contains no casts, but this was a single examination. Casts disappear quickly from the urine, and the specimen should be examined shortly after being passed. A catheter specimen of the urine showed strep. *fæcalis*, coliform organisms and *B. proteus*. The blood count was Red cells 2·4 millions per c.mm., Hb. 37 per cent. Mean corpuscular hæmoglobin concentration 26 per cent, White cells 9,400 per c.mm., polymorphs. 84 per cent, lymphocytes 8 per cent, monocytes 8 per cent.

There is therefore a severe anæmia of the iron deficiency type. What do you think is the cause of the anæmia?

A. She may have had some bleeding?

Q. Where from?

A. She may have vomited blood.

Q. To the Clerk: Has she vomited any blood before she came into hospital or since she has been here?

A. The Clerk looks through his notes, and, after a somewhat prolonged pause, says "No Sir."

Q. Has there been any bleeding from the rectum or vagina?

A. No Sir.

Q. Has she any piles?

A. No Sir.

Q. Well, Dr. B., what do you think is the cause of the anæmia?

A. It may be due to uræmia.

Q. Yes, that is so. Some workers have found a close inverse relationship between nitrogen retention and the hæmoglobin content of the blood in uræmia. There is another possible cause in this case, which we will come back to later, if I remember it. Is there anything else you want to know?

A. I should like to see an X-ray of the chest.

Q. Here is the film; the heart shadow is globular and enlarged, and the radiologist suggests she may have a pericardial effusion. There is also a small pleural effusion, more marked on the right side. Did you think from your clinical examination that she has a pericardial effusion?

A. No.

Q. Why not?

A. The heart sounds are well heard at the apex. With a pericardial effusion they should be very weak.

Q. Is there any other way of detecting a pericardial effusion with the X-rays?

A. A kymogram would be helpful. In pericardial effusion the normal serrations of the heart shadow, due to the beat of the heart, would be absent.

Q. Yes. We have not been able to do a kymogram. She could not stand up to have it done. Can any one else suggest a cause of this patient's œdema and heart failure? What do you suggest, Dr. J.?

A. Beri-beri.

Q. Where do you come from?

A. Bombay.

Q. I had not thought of beri-beri in this case. How would you find out if she has beri-beri?

A. She would probably have come from some country where beri-beri is endemic, such as the Malay States or Japan, or have been in a prisoner of war camp.

Q. I am sure we can exclude this. What else?

A. She would have been living on a diet deficient in vitamin B₁, this is usually a diet consisting almost entirely of carbohydrate.

Q. In the wet form of beri-beri there is œdema, cardiac failure, and usually fluid in the pericardium, pleuræ and abdomen, and there is often peripheral neuritis. Is there any feature of the clinical examination in this case which is opposed to a diagnosis of beri-beri?

A. The high blood pressure.

Q. Yes. How else could you test for beri-beri?

A. By examining the excretion of vitamin B₁ in the urine, and by the pyruvate tolerance test.

Q. We discussed these tests a few months ago when I showed you the case of Wernicke's encephalopathy (see p. 178). We can now approach the problem from another angle. Do you think the extensive œdema is due to cardiac or renal disease?

A. She has hypertensive heart disease, with some fluid in the pleuræ, which suggests left-sided failure. The œdema could be explained by right-sided failure, and the raised blood urea could be due to a prerenal cause, a deficient renal circulation. The absence of casts from the urine supports this view.

Q. There is a good deal of evidence in favour of the œdema being renal in origin. Pallor is much more likely to occur in renal failure than in heart failure. The œdema of the face and back of the arms which I think you overlooked, Dr. B., also favours renal disease. The absence of an enlarged pulsating liver and of venous engorgement in the neck is also opposed to a diagnosis of right-sided heart failure. If she has renal œdema what is likely to be the condition of the kidneys? In other words what renal lesions give rise to œdema?

A. Acute glomerulo-tubular nephritis, Type I nephritis.

Q. I think we can definitely exclude this. There is no marked oliguria, the average volume of urine passed in the twenty-four hours is 34 oz., there is no blood in the urine, no blood casts nor epithelial casts. What else might cause it?

A. Acute lower nephron nephrosis.

Q. What causes this?

A. Chemical poisons such as mercury, bismuth, phosphorus, arsenic, and sulphonamides.

Q. There is no evidence of any of these causes. What else?

A. Febrile albuminuria.

Q. Yes, we can exclude this. What else?

A. Pregnancy.

Q. She is certainly not pregnant. What else?

A. Hæmoglobinuria, due to mismatched blood transfusion, blackwater fever, mushroom poisoning, paroxysmal hæmoglobinuria, and the crush syndrome.

Q. There is, however, no hæmoglobinuria here. Are there any other causes? What do you say, Dr. S.?

A. Shock or low blood pressure.

Q. Yes, but the blood pressure is high here. Is there any other cause? Does no one know? Well, it sometimes occurs in diabetic acidosis or in liver disease. What other renal lesions give rise to œdema?

A. Chronic glomerulo-nephritis.

Q. What is the cause of this?

A. It may follow acute diffuse glomerulo-nephritis, or it may arise insidiously, the so-called Type 2 nephritis.

Q. I do not think we can exclude the insidious variety of chronic glomerulo-nephritis in this case or nephrotic nephritis. These types of renal disease usually occur in younger people. Is there any other possible cause of the œdema?

A. Chronic nephrosis.

Q. Yes. This may follow a healed chronic diffuse glomerulo-nephritis, or it may occur in secondary syphilis or in amyloidosis. The blood proteins are usually down to 4 per cent in chronic nephrosis, but we have had the protein estimated, and it is 6.1 G. per cent. Amyloid nephrosis is usually due to chronic suppuration, chronic tuberculosis or syphilis. The Wassermann result is not through yet, but there is no evidence of tuberculosis or suppuration. Is there any other condition which would explain the whole clinical picture? Can anyone make a suggestion?

Someone murmurs behind me: She might have diabetes.

Q. Well, the urine contained no sugar, and the blood sugar was

normal on admission. But that does not exclude diabetes, if she is under proper control. What made you think of diabetes?

A. The retinal hæmorrhages and the cataract might be diabetic.

Q. You are right. She has had diabetes for nearly twenty-one years. Insulin was given soon after the diabetes was discovered and she kept fairly well until her vision began to fail. At the end of September of this year she was admitted to another hospital in coma. Since then she has been on a 1,500 calorie diet, and has been given a morning injection of 22 units of zinc protamine insulin. We had better ask the house physician now what happened during her first night in hospital. What was it, Dr. E.?

A. She went into hypoglycæmic coma. She was only lightly in coma and came round when I injected intravenously 20 c.c. of a 50 per cent dextrose solution.

Q. And what has happened since?

A. She has required much smaller doses of insulin owing to the vomiting.

Q. Now we know that the patient has diabetes in addition to renal failure, high blood pressure, œdema, anæmia and eye changes. It is possible that the anæmia is due to diabetes. Joslin says that pernicious anæmia occurs frequently in diabetics, and with carbuncles or infections of the kidney hypochromic anæmia may occur. The patient has evidence of infection in the urine. We have mentioned that acute lower nephron nephrosis may occur in diabetes. What other kidney lesions may be met with in diabetes?

A. Arteriosclerotic and arteriolosclerotic lesions.

Q. Yes. Arteriosclerosis is very common in diabetes and the arteriosclerotic kidney is often of the malignant variety, leading to death from renal failure. In these cases, however, we do not expect to find œdema. Pyelonephritis is also met with in diabetes, and then, as the kidney fails and the patient passes into diabetic coma, the temperature is usually raised. In uncomplicated diabetic coma the temperature is not above normal, and usually it is subnormal. We know now that this patient has hypertensive heart disease, renal failure, œdema and eye changes. What do you think she is suffering from? It was described in 1936 in America.

After a silence, someone murmurs

A. Kimmelstiel-Wilson kidney.

Q. Yes. Paul Kimmelstiel and Clifford Wilson of the Mallory Institute of Pathology of the Boston City Hospital. We are fortunate in having here this afternoon doctors from Europe, Asia, Africa and Australia. Have any of you seen a case of Kimmelstiel-Wilson kidney?

No answer. After a pause someone says:

A. Please Sir, I have seen a case.

Q. You have, who are you?

A. Brown, Sir, one of your clerks.

Q. Have I seen you before? How long have you been on for me?

A. A week, Sir.

Q. And where did you see the case of Kimmelstiel-Wilson kidney?

A. At the Central Middlesex Hospital, Sir. I was a clerk there before I came on for you, Sir.

Q. Well I never! Some of you must have heard of the Kimmelstiel-Wilson kidney. What is the other name for it?

A. Intercapillary glomerulosclerosis.

Q. Yes. There are probably two types, one with a widespread thickening of Bowman's basement membrane. This is not associated with diabetes. In the diabetic variety, which is a nodular type, there are islets of hyaline material in the majority of the glomeruli, and there is a hyaline cap of thickened Bowman's membrane. The hyaline mass represents a broadening of the intercapillary connective tissue. It is best shown by special stains, and is argentophilic. Further, the afferent and efferent arterioles of the glomeruli are thickened. The kidneys usually show a high degree of arteriosclerosis. The tubules undergo fatty degeneration and lipoid is frequently found in the interstitial tissue. So much for the pathology. I have here the original paper. If you want the reference it is *Amer. J. Path.*, 1936, **12**, 83. I will read you the clinical description. "The clinical picture appears in fact to be almost as characteristic as the histological one: the patients are relatively old; hypertension is present, usually of the benign type, and the kidneys frequently show signs of decompensation; there is a history of diabetes usually of long standing; the presenting symptoms may be those of edema of the nephrotic type, renal decompensation, or heart failure; the urine contains large amounts of albumin and there is usually impairment of concentrating power, with or without nitrogen retention. Although some degree of cardiac failure is frequently present, the edema is out of all proportion to this and may be extreme when no signs of heart failure can be demonstrated. Furthermore, its generalized distribution, especially its extension to the arms and face, leads one to regard it as nephritic rather than cardiac in type, and this conclusion is supported by the constant finding of severe albuminuria."

Retinal vascular disease and cataract were subsequently added as characteristic features of the syndrome in 1939. The blood cholesterol is usually raised. Women are affected more often than men. The patients are usually over fifty years of age but the condition may occur in young persons. The diabetes has usually been present for over eleven years but the disease may be severe or mild.

There is one other clinical feature of the Kimmelstiel-Wilson

lesion of the kidney which was added to the syndrome about 1941. Does anyone know what it is?

Dr. V. says

A. Peripheral neuritis.

Q. Yes, it is better called "neuropathy"—it is not an inflammatory condition. Did you notice any signs of peripheral neuropathy when you examined the patient, Dr. B.?

A. No.

Q. Perhaps you did not look very carefully. We will go back to the bedside and see what we can find.

I examine the patient and demonstrate absence of both ankle-jerks and tenderness of both calves.

There is still another point we have time to mention, the significance of a combination of diabetes and albuminuria. I expect you all remember that Trousseau, in his lecture "Glycosuria: Saccharine Diabetes," wrote: "When albumin is found in the urine of glycosuric patients, it is when they are in the last stage of the disease."

Do you think this is true?

A. Not always.

Q. It is true in this case, but it depends upon the type of kidney lesion. I have seen several patients suffering from diabetes with albuminuria who have lived for many years, and in some cases the albuminuria has disappeared. The prognosis appears more grave if the albumen is present in considerable quantity.

* * * * *

The patient died a few days later. Two days before death the œdema disappeared from the face, and the face was quite thin. I do not know what is the explanation of this. The coma gradually deepened and passed insensibly into death.

The following are the post-mortem findings, for which I am indebted to Dr. A. Thackray:—

"Kidneys. Both kidneys were small and presented similar appearances. The capsule stripped with slight difficulty to reveal a granular surface with some larger depressed white areas. On section the cortex was irregularly narrowed. The medullary pyramids showed pale centres and the vessels were prominent. The pelvis and extra-pelvic fat were normal.

Histology showed the majority of the glomeruli to be completely hyalinized and avascular with very few nuclei to be seen within them. In areas where the process appeared less complete there were both intraglomerular and extra-capsular deposits of collagen. The arterioles showed some fibrinoid necrosis of their walls; larger vessels showed proliferating endarteritis, and the largest vessels atheroma. The

tubules showed cloudy swelling, areas of dilatation and areas of atrophy. There was diffuse fibrosis throughout both cortex and medulla, with dense, more localized areas in the cortex. There was inflammatory cell infiltration and some of the tubules contained clumps of polymorphonuclears.

Spleen. The spleen was small, weighing 50 grams. There were many depressed white areas on its surface and, on section, these extended in irregular fashion through the splenic pulp.

Histology showed the white areas to be infarcts. The surviving

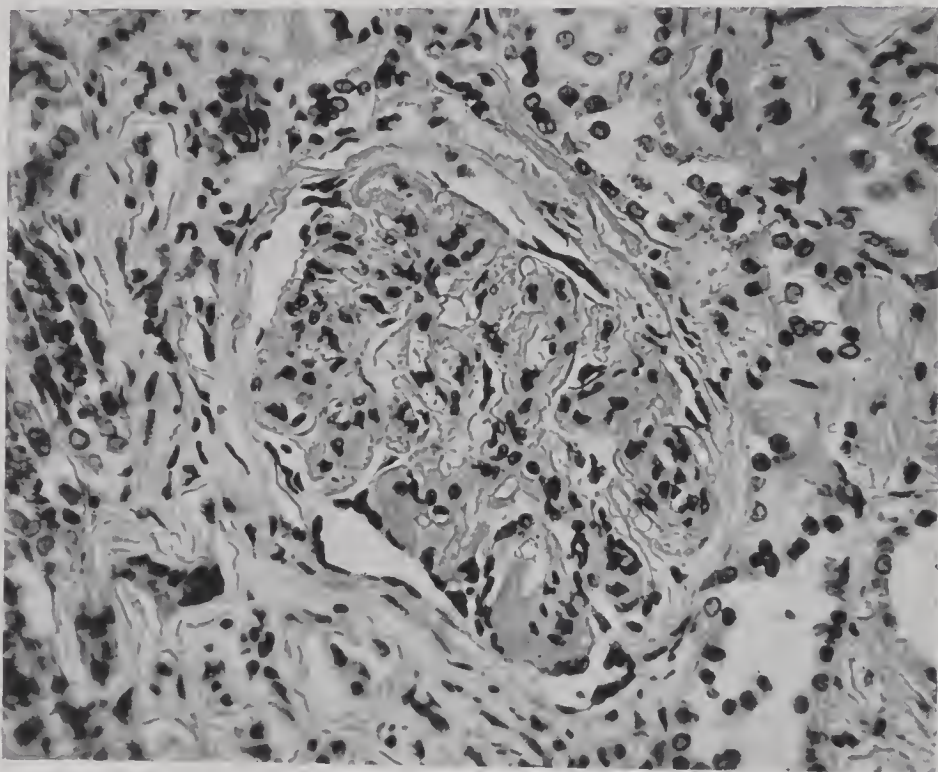


FIG. 38. Kimmelstiel-Wilson kidney, showing islands of hyaline material in a glomerulus. $\times 275$.

splenic tissue appeared normal, but the vessels showed some fibrinoid necrosis of their walls.

Pancreas. The pancreas appeared macroscopically normal. Histology showed diffuse fibrosis and vessel changes similar to those described in the spleen and kidneys.

Heart. The heart showed much hypertrophy of the left ventricle and there was diffuse myocardial fibrosis. The coronary arteries showed a mild degree of atheroma.

Small effusions of amber fluid were found in both pleural cavities and there was a small amount of ascites. There was gross œdema of the legs. The lungs showed slight congestion and œdema, and the liver chronic venous congestion.

Conclusions. Sections of the kidney show evidence of long-standing

hypertensive changes with intraglomerular lesions indicative of diabetes. These changes are those of a Kimmelstiel-Wilson syndrome (see Fig. 38). In addition, there is evidence of a superimposed malignant hypertension with fibrinoid necrosis of the vessels. There is also a terminal ascending pyelonephritis. Other organs show the vessel changes of malignant hypertension. There is left ventricular hypertrophy secondary to hypertension with cardiac failure."

The reason why certain patients suffering from diabetes develop this type of kidney is not known. It is not related to the severity of the diabetes, and acidosis is not likely to occur, even if a high carbohydrate diet with no insulin is given.

A CASE OF VASCULAR SPIDERS

I WAS asked to take this little boy into hospital to investigate the cause of his jaundice, as it had been suggested that he was suffering from acute yellow atrophy of the liver. He is nine years old. Four years ago he had an attack of glandular fever. On December 22nd last, ten weeks ago, he complained of not feeling well. He was feverish and vomited whatever he ate, even water was rejected. The next afternoon he was taken to a children's hospital, with vague abdominal pains. Appendicitis was suspected, but he was kept in hospital for only twenty-four hours. On the night of December 24th he became delirious and did not recognize his mother. He was still hot and feverish, and was vomiting. The general practitioner was called in on December 26th and found the boy's temperature 105° F. During the following days it was noticed that he was becoming jaundiced and the motions were putty coloured. The boy was readmitted to the children's hospital on January 1st and remained there until February 11th. During this time he ran an intermittent fever of 99° F. to 102° F. for eight days and then the temperature gradually fell to normal. The jaundice, however, slowly deepened and tests were made to exclude leptospirosis hæmorrhagica, hæmolytic anæmia and glandular fever. These tests proved to be negative. The liver gradually enlarged and the spleen became palpable, the vomiting ceased, but the patient lost weight, and on February 11th his mother decided to take him home. During the two weeks at home he became less yellow, took his food better, and appeared to be regaining some of his lost weight. His urine also became lighter in colour, but he was very weak.

He was admitted to hospital here on February 26th, five days ago. The temperature was 99.2° on the morning of admission, but it has since been normal. The urine was dark, it contained no sugar, no albumin and no bile salts, bilirubin or urobilin, but gave a strongly positive reaction for urobilinogen. I think you will find that there are certain points of interest in the case. Will you examine him now, Dr. L., and tell us what you find.

* * * * *

Q. What is your report, Dr. L.?

A. He is a fit-looking boy, well nourished. He is clearly jaundiced, the skin and conjunctivæ have a yellow tint.

Q. I suppose by "clearly" you mean "certainly."

A. The words are synonymous.

Q. Oh well, we will not argue about it, we will argue about something else later on. Did you notice anything else about the skin?

A. No. The tongue is rather furred, but moist. There are no other abnormalities in the mouth. Small superficial glands can be felt in both anterior triangles of the neck. The abdomen moves freely on respiration. It is soft and there is no tenderness. The liver is just palpable. It is not tender and does not feel hard. A small gland can be felt in both inguinal regions. There is no ascites.

Q. Can you feel the spleen?

A. No. The lungs and heart are normal. I found nothing abnormal in the central nervous system.

Q. Is that all?

A. Yes. That completes the examination.

Q. You did not examine the genito-urinary system?

A. No.

Q. You did not see or test the urine?

A. No.

Q. Why not? Surely that is one of the most important clinical examinations in a case of suspected jaundice. There is a specimen here. It is very pale and clear and it does not look as if it contains urobilin. Neither albumin nor casts have been found. Did you enquire about the colour of the motions?

A. No.

Q. You should have done so. They are still a little pale, but are returning to a normal colour. Dr. F., will you examine the abdomen and see if you can feel the spleen.

A. I can just feel the tip of the spleen on inspiration.

Q. That is so. What do you think about his progress, Dr. L.?

A. I think he is well on the way to recovery—he has been jaundiced about nine or ten weeks but that is not too long for a diagnosis of infective hepatitis.

Q. He certainly has not acute yellow atrophy of the liver, as was, according to his doctor, suggested at the children's hospital. He would almost certainly have been dead by now, unless it was a very mild attack. What is acute yellow atrophy of the liver usually called now?

A. Acute hepatic necrosis.

Q. Does it often affect children?

A. No, usually adults.

Q. It may occur at any age, but the patient is usually over twenty. What causes acute hepatic necrosis?

A. Some toxin.

Q. What toxin?

A. Chemical substances, usually such as chloroform or phosphorus.

Q. What else?

A. Arsenic and Atophan, and sometimes alcohol.

Q. And certain substances used in war or trades, such as trinitro-toluene and tetrachlorethane. It may also occur as a complication of typhoid fever, severe forms of influenza or in pregnancy. I expect you have all read the publications which describe necrosis of the liver resulting from chemical poisons, as toxihepatitis, and necrosis of the liver due to lack of nutritive factors in protein as trophopathic hepatitis. Have you ever seen a case of acute hepatic necrosis?

A. No.

Q. I remember seeing one in the first world war; it occurred as a complication of typhoid fever and I shall never forget it. What is the clinical picture?

A. The jaundice deepens, the patient vomits and complains of headache, he is very restless and twitches, and finally he sinks into coma and dies.

Q. Yes, and to make the picture worse he may vomit blood, pass blood in the motions and have extensive hæmorrhages under the skin. Do all patients suffering from acute hepatic necrosis die?

A. Yes, I think so.

Q. Some mild cases recover. What does the urine contain besides albumin, casts and bilirubin?

A. Some crystals.

Q. What crystals?

A. I cannot remember.

Q. Dr. W., do you know?

A. Leucin and tyrosine.

Q. What do leucin crystals look like?

A. Concentric circles.

Q. And tyrosine?

A. Sheaves of needle-like crystals.

Q. Why do you think he has infective hepatitis?

A. The history is fairly typical, with the jaundice appearing a few days after the onset of the illness, and then gradually fading away.

Q. What is the blood count in infective hepatitis?

A. It is usually normal, or there may be a slight leucopenia.

Q. The blood count in this case on admission here was Red cells 4 millions per c.mm., Hb. 80 per cent, C.I. 1, White cells 7,500 per c.mm., polymorphs. 31 per cent, lymphocytes 60 per cent, monocytes 5 per cent, eosinophils 4 per cent. If there is a marked leucocytosis in a case of jaundice, it suggests the possibility of Weil's disease. In infective hepatitis, early in the disease, there may be a lymphocytosis up to 70 per cent. You did say, Dr. L., that you noticed nothing else abnormal in the skin.

A. Yes.

Q. Dr. M., look at his skin in a good light. What do you see?

A. There is a spider nævus in front of each ear, and one on the upper lip just under the nose (see Figs. 39 and 40).

Q. Look at his hands.

A. There is another one on the back of the middle finger of the right hand over the terminal interphalangeal joint (see Fig. 41), and one on the back of the left little finger, and another one on the tip of



FIG. 39. Spider nævus in front of ear.

the palmar surface of the right middle finger, and one on the base of the palmar surface of the right thumb. There is another one on the ulnar margin of the palmar surface of the left hand.

Q. Yes. This makes eight spiders in all. What are they?

A. They are arterioles.

Q. Do they pulsate?

A. They do not appear to.

Q. If you put a glass slide over one of the spots and press lightly you can see the pulsation very clearly. Well now, let us have a little more about these vascular spiders. Dr. M., you come from Australia,

from Queensland if I remember rightly. Give me five other names for them.

A. I think they are sometimes called spider nævus or spider angioma.

Q. Yes, and in case you do not happen to remember the others I may remind you that they have been called the nævus arachnoideus,



FIG. 40. Spider nævus below nose.

the cutaneous arterial spider, and by the French, the *tâche stellaire étoile vasculaire*. Do you know anything about their structure?

A. They are composed of an arteriole which comes to the surface of the skin and can be seen to pulsate.

Q. The spider is described as having a body and legs, with a surrounding erythematous zone. The body is the central part of the arteriole which can be seen or felt to pulsate. It forms a little projection above the surface of the skin. The legs radiate from the centre, like

spokes from the hub of a wheel. They run parallel to the surface of the skin, just under the skin, and then dip down into the deeper layers of the skin. Sometimes they cross each other. The arteriole, which comes to the surface as the body of the spider, pursues a coiled course in the subcutaneous tissues, like this (see Fig. 42). They look rather like a certain kind of red seaweed which I used to find in pools on the



FIG. 41. Spider nævus on right middle finger.

beach, when I was a little younger. I think it is called the *Plocaneum cochineum*. How do the legs of the spider end?

A. They pass directly into the collecting veins.

Q. The surrounding erythematous zone is roughly circular and extends a few millimetres beyond the termination of the legs. Pressure on the central arteriole causes the legs and the whole red area to blanch. The spider does not form an arterio-venous shunt, as is seen in a glomus body. What is a glomus body?

A. An arterio-venous anastomosis which is found subcutaneously in the fingers and toes. It sometimes forms a small, very painful tumour—a glomangioma.

Q. Do the spider nævi show up in infra-red photographs?

A. No, because they are arterial and not venous.

Q. You might like to hear a little more about these spiders, if you do not all know about them. They were probably first described by Erasmus Wilson in 1869, later in 1890 they were described in France. Osler thought the legs were veins bringing blood to the centre of the spider. Their distribution is also peculiar, because they nearly always occur in areas of the body drained by the superior vena cava. They

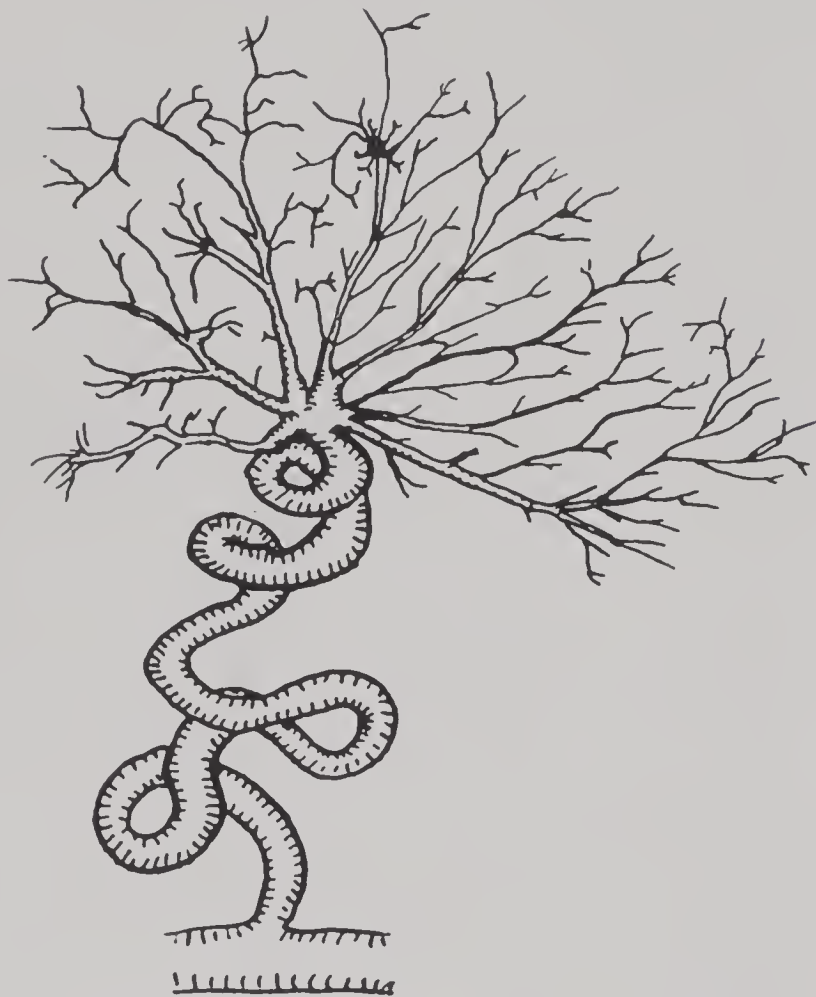


FIG. 42. Diagram of spider nævus.

(W. B. Bean, *Medicine*, 1945, 24, 243.)

have occasionally been seen in the lower part of the body. Under what conditions do they occur?

A. They are sometimes seen in healthy individuals.

Q. And when else?

A. In pregnancy.

Q. Yes, usually between the second and fifth months, and they disappear after childbirth. When else do they occur?

A. In infective hepatitis, although not very commonly, and I think they have been described in pellagra.

Q. This is due to vitamin B deficiency, and they are also met with in other forms of liver disease. In pregnancy and in liver disease the palms of the hands and soles of the feet may be red with mottled cyano-

tic spots. This red area has a sharply defined border, it is hot, the skin temperature is raised and capillary pulsation is sometimes seen. The condition is known as "liver palms." This boy does not show the liver palms but the vascular spiders are present. Pressure on the central point causes the characteristic blanching. If you want a good survey of the subject you should read the paper by W. B. Bean published in *Medicine*, 1945, **24**, 243.

Does any one know anything about the causation of vascular spiders?

A. Dr. P. says: They are associated with an excess of œstrogens in the blood.

Q. That is good. Do you know anything else about it? Who first drew attention to the relationship between liver disorders and disturbances of the sex endocrines?

Well, if no one knows, I will tell you something about it. As long ago as 1925 Corda pointed out that in cirrhosis of the liver there may be atrophy of the testicles and gynæcomastia. If you want to look it up I have the reference, Corda, L., *Minerva Med.* 1925, **5**, 1067. About fifteen years later work was done on the sex endocrines in these cases. It was found that in cirrhosis of the liver associated with gynæcomastia, testicular atrophy, and loss of body hair, there is an increased excretion in the urine of "free" œstrogens and a diminished excretion of conjugated androgens. This condition is an example of the pituitary-hepato-gonadal syndrome. The liver plays an important part in modifying the chemical nature of the gonadal hormones and so of maintaining a stable ratio in the blood of the male and female sex hormones.

Zondek first showed that the liver, and to a much lesser degree, the kidneys and spleen, inactivate œstrogens. The pituitary secretion of gonadotropic hormones is largely regulated by the quantity and qualitative nature of the circulating sex hormones, which are normally controlled by the liver. When the liver is damaged the secretion of gonadotropic hormones may thus be diminished. In the female, hepatic insufficiency, which leads to relative or absolute hyperœstrinism, results in ovarian disturbances, as shown by irregular menstruation and premenstrual tension. It also causes benign changes in the mammary glands, such as mastodynia and mammary dysplasia, and skin changes such as telangiectases and redness of the palms. In the male the effects of hepatic insufficiency are the production of an androgen-œstrogen imbalance, with a relative hyperœstrinism and the androgens are more readily inactivated than the œstrogens. This results in impairment of testicular function, gynæcomastia, telangiectases and redness of the palms. In both sexes there is a loss of steroid balance and hyperœstrinism. This all sounds very complicated,

but indicates that the telangiectases—the spider nævi—are due to a relative increase in the blood of certain œstrogens.

Now Dr. L., we will come back to you again. What do you think is the most important clinical observation in deciding the type of jaundice present in any case you may be asked to examine? I have often asked this before.

A. The intensity of the jaundice.

Q. This is certainly of value, because in jaundice due to carcinoma causing obstruction of the bile duct the jaundice deepens and may become olive green, and in acholuric jaundice the yellow tinge is often quite pale. What other observation is important?

A. The colour of the stools, if they are pale or putty coloured the jaundice is obstructive.

Q. Yes. In this case there was evidence of obstruction in the early stages, which appears to be relieved now. There are very many liver tests available for us to use, but it is useful from the diagnostic point of view, and it helps us to remember them, if we divide them into three groups—those which indicate active inflammatory changes causing parenchymal liver damage, those which show disturbance of metabolic function, and those which are tests for the excretory power of the liver. What tests are there for active parenchymal damage?

A. The determination of the plasma proteins, the flocculation tests, such as the cephalin-cholesterol test and the thymol turbidity test.

Q. We can compare the tests which have been done since the patient has been here, with those made in the acute stage of the illness when the boy was in the children's hospital. The plasma proteins in January were:—Total protein 7·8 G., albumin 3·47 G., globulin 4·38 G./100 c.c. Now the figures are:—Total protein 8·6 G., albumin 4·86, globulin 3·8 G./100 c.c. There is therefore a definite improvement, as originally there was a reversal of the albumin/globulin ratio, more globulin being present than albumin. There is no record of the previous cephalin-cholesterol test, but the present is plus 2 units. The normal figure is 0 to plus 1. The increased flocculation is due to excess of globulin and indicates some liver deficiency. The thymol turbidity was originally 40 units, and it has now dropped to 18 units per 100 c.c., which again shows an improvement. What is the normal figure for the thymol turbidity test?

A. 0 to 4 units.

Q. These tests indicate parenchymal liver damage such as occurs in infective hepatitis. What tests are there for disturbance of metabolic function?

A. The hippuric acid test, the galactose tolerance test, the presence

of urobilinogen in the urine, and the prothrombin content of the blood.

Q. The only tests for metabolic function which have been done, were carried out here, the presence of urobilinogen in the urine and the prothrombin content of the blood. In infective hepatitis one of the first hepatic functions to be altered is the power to oxidise urobilinogen to bilirubin, and so an increased urinary urobilinogen indicates impaired liver function. In extrahepatic obstructive jaundice or regurgitation jaundice there is an absence of urobilinogen in faeces and urine. When the patient was admitted here there was marked excess of urobilinogen in the urine. The prothrombin time is normal, 14 seconds in the patient, and 14 seconds in the control. What tests are there for the excretory powers of the liver?

A. The van den Bergh test, the bromsulphthalein test, and the alkaline phosphatase test.

Q. The van den Bergh test shows a direct positive reaction. This is thought to indicate regurgitation jaundice, the excess of bile present having passed through the liver cells. The excess of bilirubin is principally type B. The test is chiefly of use in following the progress of the jaundice. The early observations in this case showed a blood bilirubin content up to 15 mg./100 c.c., the normal figure being 0.1 to 0.8 mg. Now the figure has fallen to 2.2 mg./100 c.c. The bromsulphthalein test has not been done, but it has been found that there is delayed excretion of the dye both in hepatic disease and in post-hepatic obstruction. What is the bromsulphthalein test?

A. Bromsulphthalein solution is injected intravenously, 5 mg./kg. body weight. 10 c.c. of blood are removed from a vein in the arm 5 minutes and again 45 minutes after the injection, and the amount of dye in the sera is estimated. Normally the amount of dye present in the 45 minute sample is between 0 and 5 per cent. If the amount is above 10 per cent the conclusion is that there is liver damage.

Q. Why is a specimen taken at 5 minutes?

A. To see that a sufficient amount of dye has been injected to raise the blood content to between 15 and 85 per cent.

Q. The alkaline phosphatase figures were originally very high, up to 45 King Armstrong units per 100 c.c. The normal figure is 3–13 units/100 c.c. The figure has now dropped to 9.3 units/100 c.c. It is said that in extrahepatic obstruction the alkaline phosphatase figure is over 30 units, and in hepatic obstruction it is below 30 units. There is, however, an overlapping of values, and if the thymol turbidity is raised together with the high alkaline phosphatase the jaundice is probably hepatic in origin. Is there any other test which is of value in following the course of the illness in infective hepatitis?

A. The sedimentation rate of the red cells.

Q. Yes. This was 40 mm./1 hour (Westergren) when the boy was in the children's hospital, and it is now 28 mm./1 hour. So all the tests indicate that an improvement is taking place, the diagnosis appears to be well established as infective hepatitis. In such a small boy one would not expect to find any other change of gonadal function than the presence of spider nævi and to find these is certainly rare in infective hepatitis.

* * * * *

The boy was treated with a high protein, high carbohydrate, low fat diet. He was given methionine, 0.5 G. t.d.s. by mouth, and Benerva mg. 10 by intramuscular injection daily. He was discharged four weeks later. The blood bilirubin had fallen to 1 mg./100 c.c. which is slightly above normal, the thymol turbidity to 10 units/100 c.c. which is still above normal, and the E.S.R. to 19 mm./1 hour which is also above normal.

Two months later the boy's mother reported that he was very well and he was then allowed to take an ordinary diet.

A CASE OF RENAL COLIC AND HÆMATURIA

DR. H., would you like to examine the patient in No. 2 bed while we look at some X-ray films?

We gather round the viewing box in the middle of the ward. First a film of the chest is put up. The posterior half of the 7th right rib shows evidence of Paget's disease, and there is a spontaneous fracture of the right scapula. The only abnormality which the first post-graduate notices is slight uncoiling of the aorta, which he diagnoses as an aneurysm. Another candidate remarks on a right costo-phrenic adhesion, which is present. A third begins by saying "bony cage normal," which is not so. Seven or eight more candidates look at the film before anyone notices the increased density of the affected rib. No one notices the fractured scapula. Then a film of a grossly disorganized elbow joint is shown. The appearances suggest in some ways the lattice work appearance of an elbow which has been subjected to repeated hæmorrhages in hæmophilia. We discuss the causes of bleeding in hæmophilia. In this case, however, the patient was suffering from rheumatoid arthritis. The next film is a direct one of the abdomen of a patient thirty-five years of age, who, twenty years previously, had been operated on for an appendix abscess, and who had been very ill. The film shows many shadows of calcified material, varying in size from 0.5 to 1.5 cm. across, and of irregular shape. These shadows are seen in the liver and spleen regions. Various suggestions are made, such as the possibility that the shadows are due to cysticerci in the muscles. The answer is that the shadows are probably the result of portal pyæmia, and are due to calcification of small pyogenic emboli in the liver and spleen.

We also look at films showing in the same patient, Paget's disease affecting the 1st lumbar vertebra, the vertebra being dense and opaque due to amorphous changes. The films of the os calcis and of the head of the femur show marked trabeculation of the bones. By a process of guessing I gradually extract from the class that Sir James Paget described his disease in the year 1876, when he was sixty-two years of age. In both these cases of Paget's disease the alkaline phosphatase was not above normal, despite the usual teaching that in the polyostotic variety of Paget's disease, in which more than one bone is involved, the alkaline phosphatase is raised. For the last film I show the class the X-ray of the hands of a patient suffering from psoriatic arthritis. The interphalangeal joints are swollen, and the enlarged spindle shaped soft tissue swelling is clearly seen around the proximal interphalangeal joint of the middle finger of the right hand. There is loss



FIG. 43. Psoriatic arthritis.

of cartilage in the proximal interphalangeal joints but not in the terminal interphalangeal joints. The profile of the thumb nail is shown. Eventually one of the class—a student—notices the transverse thickening of the thumb nail which gives the clue to psoriasis of the

nail, and so to psoriatic arthritis as opposed to rheumatoid arthritis (see Fig. 43). I then pass round a photograph of the patient, with the characteristic skin lesions of psoriasis. The skin lesions and the arthritis both responded well to cortisone. I also comment on the fact that in psoriatic arthritis it is said that the terminal interphalangeal joints are especially liable to be affected, which was not so in this case.

Three-quarters of an hour have now passed pleasantly and we approach the bedside to hear what Dr. H. has made of the case he has been examining.

Q. Now, Dr. H., tell us the history of the case.

A. The patient is a single woman, aged fifty-eight, a trained nurse. She has had frequent colds and several attacks of pneumonia. Four months ago she got into a friend's car and sat down heavily on the back seat. She is accustomed to a car with a higher seat, so she came down with a considerable bump. She was immediately seized with severe pain in the left loin and lumbar region. The pain was in the kidney region. It went round to the front of the abdomen, but not to the groin. On arriving home she passed blood, large clots, and did not pass any urine for twelve hours, when it was blood-stained. Since then she has complained of continuous aching, pain and tenderness in the left loin, and lately there has been some pain in the right kidney region. She has also noticed numbness and tingling in the hands and feet for about a year, and loss of weight. She has come into hospital on account of the kidney pain.

Q. I have enquired very carefully into her history, and, as the case is somewhat unusual, I will ask the clerk to read out his revised version.

A. The clerk reads: Past History. The patient was born on September 6th, 1894. Measles and pneumonia, 1895. Measles and scarlet fever, 1920. Appendix removed, 1920. Both ovaries removed for dermoid cysts, 1920. The two ovaries weighed 8 lb. Tonsils removed, 1928. Left-sided pneumonia, 1930. Served as a nursing sister in the Army from 1942–1948. Knocked down by a lorry and left knee injured, 1946. Cervix amputated, 1947. Left-sided pneumonia, January and September 1949. Pott's fracture (left), May 1952. During her war service she was in Egypt, the Sudan and the Middle East. Weight 12 st. in 1930, 14 st. on joining the Army, height 5 ft. 4½ in. Weight 14 st. on leaving the Army. Weight stationary for a year, later gradually fell to 7 st. 11 lb. in 1952. She thinks the loss of weight was due to respiratory infections. She has also shrunk 2 in. in height. Shortness of breath since pneumonia in 1949. Attacks of sweating, by day or night, began in 1950, at first only on exertion. Pins and needles sensation in hands and feet, on and off,

since 1951. Aching pains across the lower part of the chest, behind, since 1951. Palpitations on exertion for the same length of time, also swelling of the ankles at times.

Present History. The patient has not been well for the last ten months, i.e., since April 1952. In May, 1952, she was admitted to another hospital with left-sided pneumonia. She left hospital three weeks later and attended the out-patients periodically for chest examinations. In August, 1952, the hands and feet were blue and cold, numb and tingling. Priscol tablets were given by mouth, but she felt very faint and dizzy, and they were discontinued. In September 1952 a bronchogram was done. It was unsuccessful on the left side. A second one done later on the right side showed no abnormality. In October 1952 she attended the same hospital on account of a dull, dragging pain in the right loin. An intravenous pyelogram was done and we have the films. The right kidney is low, with the pelvis opposite the transverse process of the 3rd L. vertebra. The left kidney shows the pelvis probably a little enlarged and the calyces enlarged. Later, in October 1952, she sat down heavily and awkwardly in a car, thinking the seat was higher than it was, and immediately had excruciating pain in the left loin which spread across the back. She felt as if she had torn something. She was driven home sitting crouching forward. She could not pass urine when she reached home, and sat on a chamber containing hot water most of the night, and drank some brandy. Between 9 p.m. and 4 a.m. she expressed digitally clots of blood from her urethra. Each clot was about the size of the top of her finger. She passed no urine for twelve hours after the accident. It was blood-stained for twenty-four hours, and subsequently clear. Since then she has had at least ten attacks of very acute pain in the left loin, usually after standing or walking a lot. Turning or twisting the body tends to bring on an attack of pain. The pain begins as an ache, then it feels as if someone is twisting her kidneys, but it is always more severe on the left side. The pain occurs in waves and she may lose consciousness. When this is about to happen she pours with perspiration. On coming round she has a dull ache in the left loin. She frequently has projectile vomiting when the pain begins to subside. The first attack of vomiting occurred two days after the accident and was preceded by waves of nausea. The vomit contains food or green liquid and is projected at least a yard.

Four weeks ago she had another attack of left-sided pneumonia. All the attacks of pneumonia have begun with pharyngo-tracheitis. The last one was followed by another attack of left renal pain and tenderness, and her doctor arranged for her admission here for investigation of the stomach and kidneys. She says she drinks a lot of fluid, but passes little urine and thinks she becomes waterlogged.

Q. Well, that is the history. Now, Dr. H., what do you think it suggests?

A. I think the jolt in the car brought on an attack of renal colic, probably owing to a stone. This would account for the hæmaturia.

Q. Are all the other attacks of renal pain due to a stone?

A. Possibly.

Q. And what about the loss of weight?

A. This may be due to the six attacks of pneumonia.

Q. The sweating and vomiting attacks would be due to the renal colic?

A. Yes.

Q. I expect you remember Sydenham's account of how he suffered from attacks of hæmaturia on being jolted, which he thought were due to a stone in the kidney.

No! I have my Sydenham with me and will read you a few lines. The article is entitled "A dissertation concerning of bloody-urine from a stone in the kidneys." In the year 1660 Sydenham had an attack of gout in the summer which kept him in bed for two months. As the gout improved he noticed a dull, heavy pain in both kidneys, but more so on the left side. He suspected a large stone in one of the kidneys which was too big to pass into the ureter. He then writes: "And several years afterwards I found I was not mistaken; for having walk'd considerably, and for a long time in the winter season, in 1676, soon after the breaking of a severe frost, I made a bloody-urine directly, and constantly did so whenever I walk'd much, or was carried in a coach over the stones, tho' the horses went slowly; but this symptom did not seize me when I travell'd in a coach on unpav'd roads, how long a journey soever I made."

Montaigne, in his Essay "Of Experience," which I also have here, gives a vivid account of the excruciating pain of renal colic from which he suffered. "Thou art seen to sweat with pain, to turn pale and red, to tremble, to vomit blood, to suffer strange contractions and convulsions, at times to let great tears drip from thine eyes, to urine thick, black, and dreadful water, or to have it suppressed by some sharp and craggy stone, that cruelly pricks and tears the neck of the bladder."

What did you find, Dr. H., on clinical examination?

A. The patient is rather thin. She is co-operative, but I think she exaggerates her symptoms.

Q. I do not think she does. Go on.

A. She sweats a lot and says she has always done this. The pulse is 60, regular. The papillæ of the tongue are slightly atrophic. The cranial nerves are normal. The trachea is displaced slightly to the left. The fingers are a little swollen and blue, and she has the "main succulente."

Q. We will come back to this later. What else?

A. There are burns on the back of the right forearm caused by touching the stove when she makes up the fire. She did not know she had burnt herself. The heart is not enlarged, the apex is "tapping." There is an apical systolic murmur. The air entry is weaker on the left side than on the right. There are some râles in both lungs. Expiration is prolonged at the right apex in front. Tactile fremitus is diminished on the left side. The blood pressure is 140/86. The arteries are not thickened. The pulses are equal. There is an abdominal swelling on both sides in the kidney region. The kidneys appear to be cystic. The left kidney is tender posteriorly. The legs are normal. The plantar responses are flexor. There is some sensory loss over a glove area of both arms, with diminished appreciation of pinprick and light touch. The urine is clear, sp. gr. 1.008, alkaline, no albumin and no sugar.

Q. What is the amount of the twenty-four hours' specimen?

A. I don't know.

Q. According to the chart it averages about 60 to 70 oz., and the fluid intake is about the same. Did you examine anything else?

A. Yes. The fundi are normal.

Q. What is your diagnosis then?

A. Congenital cystic disease of the kidneys.

Q. Do you think the lungs, liver or pancreas are also affected by congenital cystic disease?

A. No.

Q. Why not?

A. There is no enlargement of the liver and no evidence of pancreatic disease.

Q. Perhaps the so-called attacks of pneumonia were due to cystic disease of the lungs.

A. I think the lungs would be much worse now if she had cystic disease.

Q. Dr. K., what do you think of this account of the clinical examination?

A. It is rather sketchy.

Q. I agree. The examination of the heart and limbs is incomplete, that of the lungs and abdomen inaccurate. The apex of the heart is easily felt in the 5th left space, 4 in. from the mid-line. There are no thrills. The systolic murmur accompanies the first sound and is localized to the apex. The brachial arteries are thickened and tortuous. There is obviously arteriosclerosis. The trachea is central. The chest is square-shaped. The percussion note is resonant all over, tactile fremitus is present, the breath sounds are harsh over both lungs. There are medium râles at the left base. The right kidney is easily felt low down in the abdomen, it does not appear enlarged and its surface is

smooth. The abdomen is very tender over the left kidney, and there is marked costovertebral tenderness on the left side. The kidney is enlarged, it does not appear irregular. The brown scars on the extensor surface of the right forearm are very superficial and have almost faded. There is no definite impairment of sensation in the arms or legs. Appreciation of heat and cold is normal. I do not agree with the diagnosis of "main succulente." What do you mean by this term, Dr. H.?

A. It occurs in syringomyelia. There is thickening of the subcutaneous tissues, and the hands and fingers are enlarged.

Q. Yes. In syringomyelia sometimes the fingers alone are affected, they are thick, swollen, red or blue and are called "sausage fingers." Charcot described the "fleshy hand" or "main succulente." If you thought she had this condition, why did you not test the heat and cold sensations? Our physical examination suggests some basal bronchitis on the left side, probably resulting from the six attacks of pneumonia, border-line enlargement of the heart, arteriosclerosis, and an enlarged and very tender left kidney. Is there a neurologist here? Yes, I see Dr. B. Will you examine the knee-jerks and say whether they are equal.

Dr. B. examines them several times very carefully and decides that the left is slightly more brisk than the right.

Q. This is interesting as I will tell you later. Now, Dr. H., do you still think she is suffering from congenital cystic disease of the kidneys?

A. Yes.

Q. What investigations would you like carried out?

A. The blood urea.

Q. Why?

A. If she has cystic disease of the kidneys with periodical attacks of vomiting the blood urea will be raised.

Q. It is 30 mg./100 c.c. This favours the view that only one kidney is affected. What other investigations would you like?

A. An X-ray of the chest.

Q. Here it is. The aorta is slightly uncoiled, suggesting atheroma. The left ventricle is prominent, but the heart is not enlarged. The lung fields appear normal except for some shadows of residual lipiodol in the right mid-zone. The trachea is central. What else do you want?

A. An intravenous pyelogram.

Q. This shows the right kidney low with its pelvis opposite the transverse process of the 4th lumbar vertebra, and the left kidney shadow enlarged, extending from L.1 to L.5 vertebræ, and measuring 6 in. from top to bottom. The right kidney is excreting the dye at 5 minutes, the calyces, pelvis and ureter appear normal. The left

kidney begins to excrete at 15 minutes, the calyces are grossly dilated. the pelvis is a little dilated. The kidney shadow becomes very dense at one hour owing to the dye passing out from the calyces into the tubules and possibly into the renal venous system. The left ureter is not seen in any of the films. The bladder shows no abnormality. The appearances suggest obstruction at the pelvi-ureteric junction, or at the junction of the major calyces with the pelvis (see Fig. 44).

Other investigations have been done. The Hb. is 99 per cent. The white cells number 13,200 per c.mm., with a normal differential count.

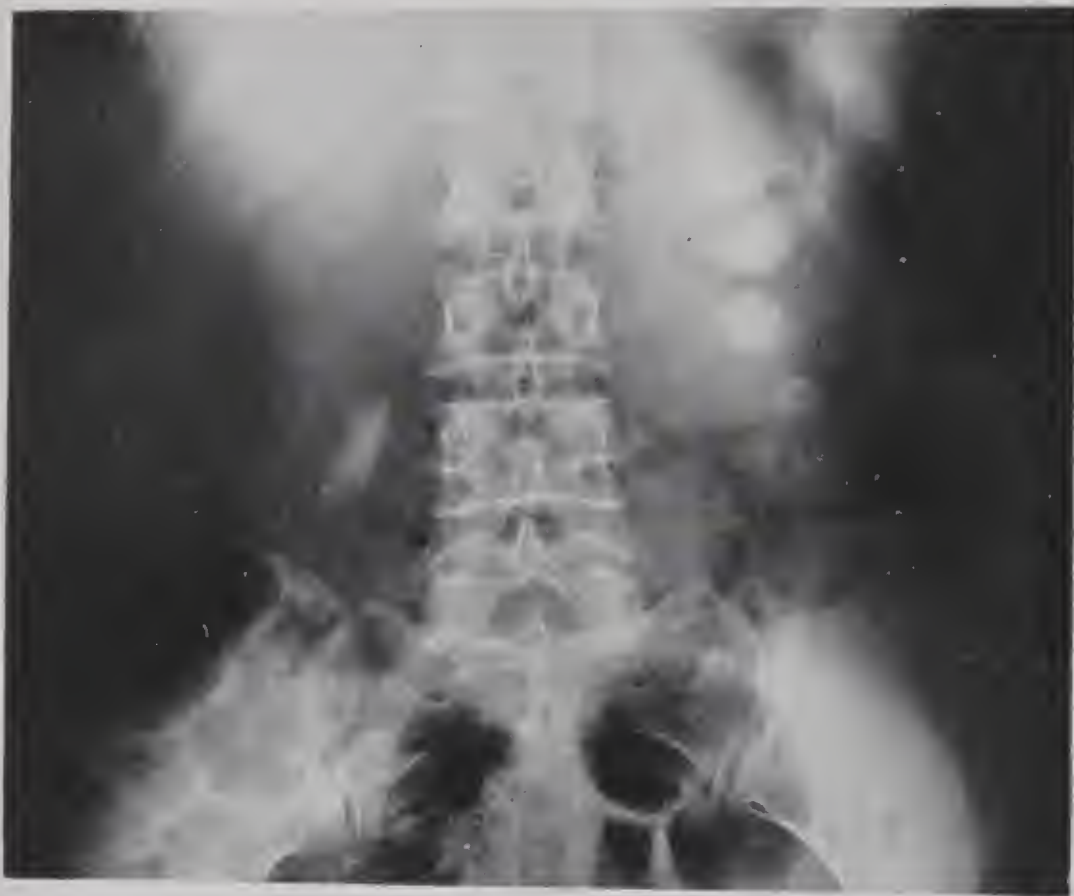


FIG. 44. Pyelogram showing intrarenal hydronephrosis of left kidney.

The sedimentation rate of the red cells is 10 mm. at 1 hour (Westergren). The blood Wassermann reaction is negative. A barium meal shows no abnormality in the œsophagus, stomach, duodenum or intestines. The sputum contained no tubercle bacilli and no malignant cells. There was a scanty growth of staphylococcus pyogenes. A catheter specimen of urine was examined. The deposit contained a few white, red and epithelial cells and profuse organisms. There was a moderate growth of *B. proteus* and *Bact. coli*. The electrocardiogram showed left axis deviation.

A retrograde pyelogram has also been done on the left side. The catheter passed easily and there was no ureteric obstruction. There is

slight dilatation of the pelvis and considerable dilatation of the calyces. The patient had an attack of renal pain on the left side during the examination. The urine obtained from the left kidney was sterile. This suggests that there is some pyelitis on the right side. It might be well to repeat the examination of a catheter specimen of urine.

We have now arrived at the following conclusions: The general ill-health is probably due to the recurrent attacks of left basal pneumonia. This always begins with symptoms of pharyngo-tracheitis and there may be some posterior nasal infection. This is to be investigated. The so-called pneumonic attacks may be a recurrent basal bronchitis due to inhalation of mucus, or they may be due to a chronic bronchial infection associated with some dilated bronchi. A bronchogram of the left lower lobe would decide whether any bronchiectasis is present. The loss of weight may be partly due to dieting but the patient denies this. The symptoms of peripheral neuritis may be associated with a chronic bronchial infection. The attacks of sweating and vomiting are due to renal colic. The renal colic is associated with the left unilateral hydronephrosis and there is no evidence of stone.

What are the causes of unilateral hydronephrosis, Dr. P.?

A. The common causes are conditions which obstruct the ureter, especially a stone.

Q. What else?

A. Tuberculosis affecting the lower end of the ureter. There may be a stricture or new growth of the ureter, or œdema of the wall of the ureter.

Q. What are the external causes of ureteric obstruction?

A. A pelvic or abdominal tumour, or an aberrant renal artery.

Q. What are aberrant renal arteries?

A. They are persistent embryonal arteries. The metanephros forms the permanent kidney. As it develops it moves upwards and receives its blood supply from the lateral splanchnic stem arteries arising from the aorta at successively higher levels, the definitive or permanent renal artery being derived from the L.2 segment. Aberrant renal arteries are due to persistence of the primitive arteries, and they may be superior polar or inferior polar.

Q. Embryology good, Dr. P.! It is said that an inferior polar artery may obstruct the ureter, but this is doubtful, as the obstruction often persists after the artery has been divided. How could you find out if there is an aberrant renal artery in this case?

A. By an aortogram.

Q. How is this done?

A. I don't know. I've never seen one done.

Q. I will ask the registrar to tell us.

The registrar: The examination is carried out in the X-ray depart-

ment under general anæsthesia, with the patient lying prone. A needle, 15 cm. long, No. 16 s.w.g., is inserted below the left 12th rib 4 fingers' breadth lateral to the lumbar spinal processes. The needle is directed upwards, inwards and forwards till it touches the body of L.1 vertebra. It is then withdrawn slightly and guided to the side of this vertebra until it enters the aorta. A syringe is attached to the needle containing saline. When the needle enters the aorta blood gushes into the syringe. Thirty c.c. of 70 per cent Diodone are then injected into the aorta, and four films are taken at two seconds intervals, the first being taken after 15 c.c. have been injected.

Q. What else may cause obstruction?

A. Kinking due to nephroptosis.

Q. Yes, but this is also doubtful, although it is said to be the cause of Dietl's crisis. Hæmaturia may occur in a Dietl's crisis. Fibrosis of the perirenal tissues, causing adhesions, may lead to unilateral hydronephrosis. What are the causes of pelvi-ureteric obstruction?

A. Chronic pyelitis.

Q. What else?

A. A stone or neoplasm in the pelvis.

Q. Often no pathological change is present at the pelvi-ureteric junction. These cases are considered to be due to achalasia or to overaction of the sympathetic nerve supply to the kidney. Unilateral hydronephrosis may be congenital, due to stenosis of the ureter, but congenital hydronephrosis is more frequently bilateral. When the pelvis is chiefly dilated the condition is called hydronephrosis. When the calyces are grossly dilated and the pelvis to a lesser degree, the condition is intrarenal or calycean hydronephrosis. The term internal hydronephrosis is applied to acute dilatation of the renal tubules and Bowman's spaces, with normal sized calyces. This may result from obstruction of the tubules by crystals or casts. In our case the condition is mainly that of intrarenal hydronephrosis. If it persists the renal tissue may be reduced to thin septa between the dilated calyces. A characteristic feature is the poor secretion of the dye after intravenous pyelography, and the delayed secretion on the affected side.

The bleeding which occurred when she sat down with a bump may have resulted from a tear in a calyx communicating with the venous system of the kidney.

In order to understand how the calyces dilate to form the intrarenal hydronephrosis in the condition known as *renal achalasia*, or *renal sympatheticotonus*, or *sympathicotonus* we must consider the physiology of this part of the excreting apparatus. What is the nerve supply for the calyces, pelvis and ureter?

A. The sympathetic fibres from the 11th and 12th Th. segments to the 1st and 2nd L. segments. The fibres pass along the splanchnic

nerves to the renal plexus at the hilum. The parasympathetic fibres come from the vagus and reach the kidney in the periarterial nervous plexus.

Q. The pelvis and ureter have three muscular layers, and these layers are said to be condensed into ring muscles at certain points; around the renal papillæ where they exert a milking action and so fill the secondary calyces with urine; at the junction of the major calyces with the pelvis; and at the junction of the pelvis and the ureter. There are said to be two sphincters in the ureter formed by ring muscles, and the intervening portions of the ureter are called ureteric spindles. The sympathetic nervous impulses cause relaxation of the walls of the calyces and the pelvis and constriction of the ring muscles, and the

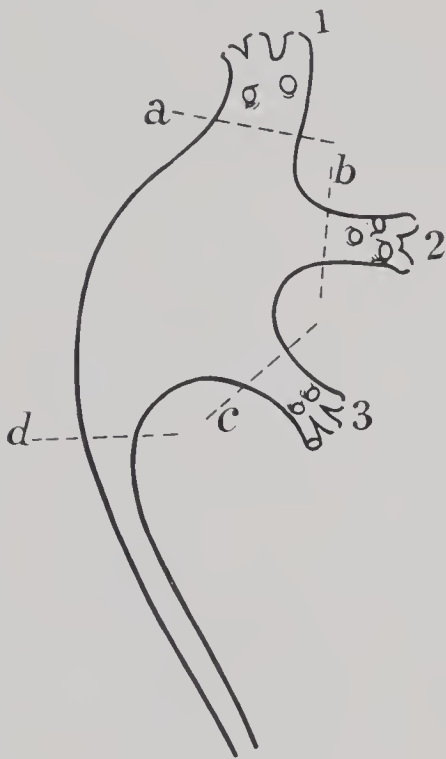


FIG. 45. Diagram showing: *a, b, c.* Ring muscle sphincters at junction of major calyces with renal pelvis. *d.* Ring muscle sphincter at pelvi-ureteric junction. 1. Cephalic, upper primary or major calyx. 2. Middle primary or major calyx. 3. Caudal, lower primary or major calyx.

vagal impulses have probably an opposite effect. Normally the calyces, pelvis and ureter contract and dilate rhythmically, so that the urine is passed from the calyces to the bladder. The sphincters open and close to allow the passage onward of the urine. What is the normal anatomical arrangement of the calyces and pelvis?

A. The pelvis is said to be shaped like a trumpet. The major calyces open into it. There are usually three or four major or primary calyces. An upper or cephalic calyx, one or two middle calyces, and a caudal or lower calyx. Usually four minor calyces open into the cephalic major calyx, and four to six minor calyces open into the middle calyces and the same number into the caudal calyx.

Q. We can draw a diagram to illustrate this (see Fig. 45). The systole and diastole of the calyces and pelvis, and the contraction and

relaxation of the ring muscles maintain a forward and downward passage of urine. In the kidney the cephalic or upper primary calyx contracts, the sphincter at its neck relaxes and it empties into the pelvis, then the sphincter at its neck contracts and shuts it off from the pelvis and it begins to fill again. The middle calyx now goes through a similar process and finally the inferior calyx contracts and empties into the pelvis and immediately the pelvis contracts and empties into the ureter. The ring muscles at the pelvi-ureteric junction and in the ureter contract and relax rhythmically. If the ring muscles at the junction of the major calyces with the pelvis do not relax adequately, the calyces dilate and lead to intrarenal hydronephrosis. If the ring muscle at the pelvi-ureteric junction does not relax normally, dilatation of the pelvis occurs. And so sympathicotonus will lead to hydronephrosis.

Having made the provisional diagnosis of renal sympathicotonus we can go back to the question of the knee-jerks. It is said that the knee-jerk may be exaggerated on the side of the kidney lesion, and our neurologist, Dr. B. found the knee-jerk on the left side slightly exaggerated. What treatment would you advise, Dr. C.?

A. Some drug might be used which inhibits the action of the sympathetic.

Q. Such as?

A. Eserine.

Q. How much would you inject?

A. 1/60th of a grain.

Q. This may produce a temporary relief of pain and spasm, but better and more lasting results are said to be obtained with Pituitrin. The usual dose is 0.5 c.c. subcutaneously daily for two weeks, then 0.5 c.c. on alternate days for two weeks, and a maintenance dose of 0.5 c.c. once a week for six weeks. This may cause intestinal spasm with a tendency to diarrhœa. If you are interested in this you should look up the paper by J. G. Yates Bell in the *Proceedings of the Royal Society of Medicine* (1949, 42, 541). It was shown by Jona in 1928 (Jona, L. (1928), *Med. Journ. Austral.*, 2, 118) that Pituitrin produced rhythmic contractions of the calyces and pelvis which were followed by relaxation and relief of pain. Yates Bell concluded that a small number of cases of renal sympathicotonus are cured by Pituitrin, but a large number relapse and eventually require sympathectomy. We are going to try this patient with Pituitrin and I will let you know later how she fares.

* * * * *

I saw the patient again four days later. All pain and tenderness had now gone from the left loin and costo-vertebral angle and I could only feel the kidney with difficulty; it appeared of normal size.

After another week there was no tenderness in the left renal area



FIG. 46. Pyelogram showing diminution of hydronephrosis following Pituitrin treatment.

and I could not feel the kidney. A bronchogram of the left lung showed the bronchi normal, except that a left lower lobe posterior bronchus appeared slightly dilated. The E.N.T. specialist found no abnormality except a little dulness of the left antrum on transillumination.

Finally the intravenous pyelogram was repeated after four weeks' treatment with Pituitrin, and it showed the left kidney now excreting at 5 minutes and only a mild degree of hydronephrosis (see Fig. 46). The patient had lost her pain and seemed very well.

A CASE OF VOMITING

THIS patient was admitted with a mass of documents relating to his previous medical history, sent in by his private doctor. The clinical clerk has endeavoured to unravel the somewhat complicated story and I will call upon him now to read the history.

The clerk reads: The patient is a married man, sixty-two years of age, a retired clerk. He says that he has had periods of gastric trouble for the past eighteen years. In 1948 he collapsed without warning while dictating letters. He had eaten a fish lunch one and a half hours previously. He was sick and vomited blood. Three weeks later he was given a barium meal and a barium enema, but nothing abnormal was found. In May 1949 he had a second attack of hæmatemesis and was admitted to hospital. Two days later he vomited blood for the third time, without any warning, and he was now given a blood transfusion. The next day he was operated on, partial gastrectomy and gastro-enterostomy being performed. The operation was followed by pneumonia. Four months later he resumed work, but the operation was not successful in relieving him of his gastric symptoms, on account of which he retired in 1950. The chief symptoms then were epigastric pain two hours after food, giddiness and sweating. In March 1951, however, as his health had considerably improved, he resumed part-time work. The following April he collapsed at work, feeling very giddy as he was sitting in a chair. He did not vomit then, but subsequently he had recurrent attacks of vomiting, and was admitted to his local hospital again in July 1952. The barium meal report reads as follows: "There has been a partial gastrectomy. The stoma functions poorly, but at 1½ hours there is very little left in the stomach. At 5 hours the meal has reached the cæcum." The barium enema, cholecystogram and the sigmoidoscopic examinations showed no abnormalities.

Three weeks later he returned home, the vomiting having ceased, but it recurred at the end of August, and on September 8th, after vomiting a considerable amount of bile four times in one morning, he was again admitted to hospital. The barium meal was repeated, the report being: "There is rapid emptying of the stomach through the gastro-enterostomy opening, but there is no evidence of an active ulcer in the stomach or duodenum." He was now examined by a neurologist on account of dizziness and black-outs. The neurologist attributed the condition to low blood pressure and advised treatment with Benzedrine. As the patient did not improve with this treatment he was admitted to this hospital on October 15th, ten days ago, for

further investigations. He is still suffering from repeated attacks of vomiting, and he complains that food appears to stick immediately after swallowing, and slowly percolates to what he describes as "the point at the end of the ribs at the top of the centre of the body." When asked where this is he points to the region of the xiphoid cartilage. On admission here he said he had been vomiting every day for the last six months, and for the past two weeks the vomiting had been getting worse. For two years he has suffered from colicky epigastric pains about two hours after food. He tends to vomit shortly after food, or even while eating. The vomit may consist almost entirely of chewed food, and sometimes it is mixed with green bile. The food feels as if it sticks in the gullet for minutes or hours, and this feeling is relieved by belching. Fluids stick less than solid food. He may vomit as much as 8 oz. at a time, but the vomit is not excessively offensive. The bowels are opened regularly with paraffin and there is no diarrhoea. He also feels faint at times after food, sweats and is giddy.

Q. Thank you, Mr. C. That is a very good history. Now Dr. V., will you examine the patient.

* * * * *

Q. What do you find?

A. The patient is very thin, but his colour is good. He has lost about $2\frac{1}{2}$ st. in weight since the operation. He is co-operative. I can feel a few small soft axillary glands. His teeth are good and he has no dentures. The tongue is clean and throat normal. The heart is normal, pulse regular, 68, blood pressure 165/85 mm. Hg. The lungs are normal. There is a mid-line epigastric operation scar, soundly healed. There is tenderness to the right of this scar, and a movable firm mass, about the size of a plum, is palpable about 2 in. to the right of the scar, inside the abdomen. On rectal examination the prostate is enlarged and hard, the left lobe being larger than the right. The mucous membrane moves freely over it. There are no urinary symptoms. The legs are normal.

Q. Does he look ill?

A. Yes, he is thin and weak and he says he feels wretched. The vomiting is very distressing and he has no appetite.

Q. What do you think is the matter?

A. I think he must have some obstruction at the lower end of the œsophagus.

Q. What investigations would you like made?

A. A barium swallow and barium meal, and then probably a blood count, estimation of the sedimentation rate of the red cells, and examination of the fæces for occult blood.

Q. Here are the barium meal films, and the report reads: "A

partial gastrectomy has been performed. After one mouthful barium passed through the stoma into the efferent loop very rapidly. When the stomach remnant had been filled, emptying took place hardly at all. The one hour film showed that almost all the barium had left the stomach. It is very unusual to see this delay in emptying with the stomach full. It may be due to mechanical conditions at the stoma." The blood count is Hb. 73 per cent. Red cells 4.4 millions per c.mm. C.I. 0.8. White cells 4,700 per c.mm., polymorphs. 65 per cent, lymphocytes 22 per cent, monocytes 9 per cent, eosinophils 3 per cent, basophils 1 per cent. The sedimentation rate of the red cells is 5 mm./1 hour (Westergren). The occult blood test is negative.

What do you think now?

A. There is no œsophageal obstruction. There may be some mechanical obstruction at the stoma causing the vomiting. The normal sedimentation rate of the red cells and the negative occult blood test on the fæces are opposed to an ulcer or a growth.

Q. What would you advise doing then?

A. I should like the barium meal repeated.

Q. Why?

A. To see if there still appears to be an obstruction at the stoma or whether the delay may be due to spasm.

Q. This has been done, and the report is: "At this examination the behaviour of the stomach remnant noted at the last examination was not repeated. The stomach emptied at an average rate when it was full. It is possible that the behaviour of the stomach remnant described in the previous report is an intermittent phenomenon." This seems rather to support your suggestion of spasm, Dr. P., but what about the plum-sized lump you felt in the abdomen?

A. I think this may be due to some adhesions or mesenteric thickening following the operation.

Q. The whole condition is therefore functional?

A. Yes, I think so.

Q. What treatment would you give?

A. Antispasmodics such as belladonna or Banthine, and gastric sedatives such as bismuth or perhaps cerium oxalate.

Q. Cerium oxalate is not used often now, but it used to be given quite a lot, and also dilute hydrocyanic acid. I do not think they were of much use. What is the dose of cerium oxalate?

A. 5 to 10 grains.

Q. No. It is 2 to 10 grains. How is it given?

A. In a mixture with sodium bicarbonate.

Q. It is insoluble in water and is usually given in a cachet. Dr. R., have you any suggestion to make?

A. Could it be a "dumping syndrome"?

Q. What do you mean by that?

A. A group of symptoms which occur after gastro-enterostomy, but especially after partial gastrectomy.

Q. When was it first described?

A. I think Hurst described it a long time ago.

Q. Hurst published his paper in 1913 in the *Annals of Surgery* (1913, 58, 466). I have it here. He describes a series of about 20 patients upon whom gastro-enterostomy had been done for various conditions, most commonly duodenal ulcer. These patients complained of a sense of fulness during each meal, which might so diminish the food intake as to cause loss of weight. There might also be diarrhœa. He did not use the term "dumping syndrome," but he referred to the "rapid drainage of the stomach," and considered the symptoms were due to distension of the jejunum. He found the symptoms were relieved by lying down for half an hour after each meal. Who was Hurst?

A. Physician to Guy's Hospital.

Q. Yes, but you will see when he wrote this paper his name was Hertz. I first met him when I was a student at Oxford. He lectured to us from 12 to 1 o'clock on Friday mornings during the summer term, on pharmacology. He used to come up from London each week especially to these give lectures. I could not understand why he did it. Later, when the first World War came, he changed his name to Hurst. What is the next stage in the history of the "dumping syndrome"?

No answer.

Q. In 1922 Mix described what he called the "dumping stomach" following gastro-jejunostomy. The diagnosis was made on the basis of X-ray findings, typical symptoms being absent. If you want to look up the paper the reference is Mix, C. L., 1922, *S. Clin. North America*, 3, 617. A great deal of attention has been paid during the last few years to the manner in which the symptoms of the dumping syndrome are produced. What are the symptoms?

A. The most important is a feeling of epigastric fulness coming on while the patient is eating, or directly afterwards. The patient often feels faint and is relieved by lying down.

Q. Custer (1) in 1946 described four cardinal and almost invariable symptoms of the dumping syndrome. They begin suddenly, either during a meal or immediately after. They are nausea and weakness, a generalized and unpleasant sensation of warmth throughout the body, cold sweats on the face, and palpitations. There may also be borborygmi and diarrhœa. The muscular weakness and drowsiness may be very marked and syncopal attacks may occur. What causes these symptoms?

A. I think Hurst was correct when he said that the epigastric

fulness and the diarrhœa are due to the rapid passage of food from the stomach into the jejunum, resulting in distension of the jejunum.

Q. There is some evidence to support this view. If an inflatable balloon is passed into the jejunum after a gastrectomy, and the balloon is blown up, the feeling of epigastric fullness ensues and sometimes faintness. The symptoms have been thought to be due to vagotonia, but against this view is the fact that atropine affords no relief. What other views have been put forward to account for the symptoms of the dumping syndrome?

A. It has been suggested that the immediate symptoms which occur during or shortly after a meal are due to a rapid rise of the blood sugar to above the normal maximum figure, owing to rapid absorption of sugar from the duodenum. This has been called hyperglycæmic shock.

Q. Yes, blood sugar curves show a rise of the blood sugar to about 220 mg./100 c.c. half an hour after swallowing the dextrose, followed by hypoglycæmia, the blood sugar falling to about 50 mg./100 c.c. in 2½ hours. Some authors have gone so far as to say that the hypoglycæmia following partial gastrectomy is the cause of all the symptoms of the dumping syndrome. I do not agree with this. What else may account for the muscular weakness?

A. It may be due to a low blood potassium.

Q. Yes, Hamilton Smith (2) showed a significant fall in the blood potassium and electrocardiographic changes associated with potassium deficiency in patients suffering from severe dumping attacks. Now there are certain other terms used in connection with disturbances following gastrectomy. What is meant by the afferent loop syndrome?

A. There is bilious vomiting which is thought to be due to kinking of the afferent loop resulting in afferent loop stasis. The bile may regurgitate unmixed with food, later there may be vomiting of food. There is also usually epigastric fullness or pain.

Q. And what is the efferent loop syndrome?

A. This is what is usually called the dumping syndrome, epigastric fullness, and vomiting of food, not mixed with bile.

Q. What types of gastrectomy are associated with the dumping syndrome?

A. It may occur with any type of gastrectomy, the Billroth I, the Pólya-Moynihan, or the Hofmeister-Finsterer. The more extensive the gastric resection the more likely is dumping to occur.

Q. In some series dumping has been noted in 75 per cent of cases six months after the operation, but it is likely to improve. In about 10 per cent it is severe. What are the special features of the Billroth I operation?

A. The stomach is directly anastomosed to the cut end of the duodenum.

Q. What happens in the Pólya operation?

A. In the Pólya operation the cut end of the stomach is anastomosed with the side of the jejunum.

Q. And what is the chief difference between the Pólya-Moynihan and the Hofmeister-Finsterer operations?

A. In both the stomach is anastomosed with the jejunum, but in the Pólya-Moynihan operation the stoma is larger than in the Hofmeister-Finsterer operation.

Q. I expect you are correct, but I do not know very much about these surgical technicalities. In our case there was bilious vomiting, which suggests an afferent loop syndrome. We also estimated the blood sugar and the potassium. The blood sugar directly before a meal was 107 mg./100 c.c., immediately after the meal it was 135 mg./100 c.c., and at $1\frac{1}{2}$ hours after the meal it was 111 mg./100 c.c., so in this instance, although the patient had dumping symptoms and faintness, there was neither an immediate hyperglycæmia nor a delayed hypoglycæmia. The serum potassium was also normal, 4.7 mEq/L, so that there was no evidence that muscular weakness was due to hypopotassæmia.

I thought the "dumping syndrome", due to rapid distension of the jejunum, was the most likely diagnosis, but I asked a surgeon to see him. He reported that he could feel a mass high up under the left costal margin, probably due to an anastomotic ulcer with inflammatory changes around.

And these are all the questions I have time to ask this afternoon, but, as Bacon wrote, "he that questioneth much, shall learn much, and content much."

* * * * *

A laparotomy was performed on November 9th, 1952, when it was found that there was a large carcinoma arising in the remaining portion of the stomach, involving practically the whole of it and extending up into the œsophagus. The growth surrounded the anastomosis and was obstructing the afferent loop of the jejunum, which was much distended. There was widespread glandular involvement, secondary deposits were present in the diaphragm, and any radical operation was out of the question. An anastomosis was performed between the afferent and efferent loops of the jejunum.

Thus the feeling of food sticking at the lower end of the œsophagus was explained. It was probable that the original ulcer in the stomach was malignant. The patient did well for a time after the operation and was free from vomiting.

In April 1953 the patient was still eating well and the food did not stick, but in June the vomiting returned with much flatulence and anorexia. The food was also felt to stick once more in the lower part of the chest. The patient now went steadily down hill and died in December 1953.

It is noteworthy that none of the X-ray examinations afforded a suggestion of carcinoma of the stomach; that the occult blood test was negative on the fæces, and that the sedimentation rate of the red cells was normal.

References

1. CUSTER, M. D., Jr., BUTT, H. R., and WAUGH, J. M. (1946). *Ann. of Surg.*, **123**, 410.
2. SMITH, W. HAMILTON (1951). *Lancet*, *ii*, 745.

A CASE OF JAUNDICE

Now Ladies and Gentlemen, you have only to look at this patient to see that she is suffering from a fairly intense degree of jaundice, because, in addition to the dusky or brownish-yellow colour of the skin, the conjunctivæ are brightly tinged with yellow.

She is a married woman, fifty-three years of age, whom I first saw in September 1951, over two and a half years ago. In 1942, eleven years ago, she had a bad attack of jaundice lasting about nine weeks. Jaundice was epidemic in her neighbourhood at the time, but in the majority of cases the jaundice cleared up in a few days. She remained free from jaundice until May 1950 when she noticed, while on holiday, that her urine was dark. This was followed by headache, subcostal pain worse on the right side, and the gradual onset of jaundice. A week or so later her skin began to itch. The motions were bulky and soft, at first almost white, later becoming grey and finally pale yellow. She returned home, saw her doctor, who ordered her to bed for five weeks, and then she was admitted to another hospital to exclude the possibility of gall-stones. She was sent home after ten days, as the jaundice appeared to be fading. However, it did not disappear although she felt better in herself. At the end of December 1950 attacks of profuse diarrhœa and vomiting began. They would wake her during the night and occurred at first at intervals of a month or so, and later about every ten days. The vomiting only lasted for one night, but she was very exhausted after the attacks and stayed in bed two or three days. Early in May 1951 she was again admitted to the hospital outside London and a laparotomy was performed. There was no sign of extrahepatic biliary obstruction, the gall-bladder was small and empty, the common bile duct was also small. A portion of the liver was removed for microscopical examination. The patient was sent home and the jaundice gradually diminished.

You will remember that I told you I was first asked to examine the patient in September 1951. I considered then that, although she was sallow, there was no definite evidence of jaundice. The conjunctivæ were not icteric, the urine contained no bilirubin, and the motions were described as rather pale, a dark cream colour. They were very loose, the bowels being opened three to twelve times in the twenty-four hours. The liver was, however, palpable 2 in. below the right costal margin, and I did not feel the spleen. The treatment at this time consisted of a high protein and low fat diet. Mrs. F. had not then lost weight, her height being 5 ft. 1 $\frac{3}{4}$ in., and weight 7 st. 13 lb. (clothed).

During January 1952 she felt much better, with no jaundice and no itching.

I did not see the patient again until the end of March 1952. She then showed evidence of slight jaundice, the skin generally was sallow, but the conjunctivæ were faintly icteric. She had lost 7 lb. in weight. The urine was mahogany-coloured, and contained bilirubin. The motions were grey or, as she described them, "a light cream colour." Mrs. F. was now suffering from the third attack of jaundice. She told me that she did not feel well, her health varied, seeming to go through the following cycle, first extreme weakness and great abdominal discomfort "like a witch's cauldron" in the epigastrium, followed by looseness of the bowels, intense irritation of the skin, insomnia, waking nightly about 2 a.m., and then nausea for a few days, but no vomiting. There was great depression during these phases which persisted for about three weeks. Then she had a period of about two weeks in which she felt better and was able to do some housework and cooking. I advised her to come into hospital here for further investigations. She was admitted for the first time on April 4th and discharged on October 26th, 1952. During this long stay she was afebrile for the first twenty-three weeks, then ran a temperature of 99° to 100° F. for four weeks, and was then afebrile again for the last two weeks. Her weight remained stationary at 7 st. 5 lb. (in pyjamas). The jaundice varied, the *serum bilirubin* being 4 mg./100 c.c. on admission. In the middle of July it rose to 19 mg./100 c.c., and on discharge it was 8 mg./100 c.c. The *serum cholesterol* also rose and fell, being 400 mg./100 c.c. on admission, rising to 1,150 mg./100 c.c. in the middle of July, and falling to 650 mg./100 c.c. on discharge.

Q. What are the normal serum bilirubin and serum cholesterol values?

A. The serum bilirubin is 0.1 to 0.8 mg./100 c.c., and the cholesterol 140 to 280 mg./100 c.c.

Q. The *sedimentation rate of the red cells* was 35 mm./1 hour (Westergren) on admission, reaching 90 mm. in the middle of July, and falling slightly to 84 mm. on discharge. The *hæmoglobin* on admission was 88 per cent and it fell to 58 per cent shortly before discharge, when she was given a blood transfusion of 3 pints of whole blood.

There was no doubt that the jaundice had varied considerably during the six months before admission, sometimes the skin was mahogany-coloured, sometimes it was almost normal. On direct questioning she said that she had never noticed yellow vision. On admission, the house physician said he could feel the tip of the spleen on inspiration, but I did not agree with this and I have not felt it since. Various liver function tests were carried out. The *alkaline phosphatase* was raised to 48 King-Armstrong units. A reading as high as this is

said to indicate extrahepatic biliary obstruction although it may occur in cirrhosis. What is the normal alkaline phosphatase?

A. 3 to 13 King-Armstrong units.

Q. The *thymol turbidity test* was slightly raised, 5 units, the normal value being 0 to 4 units. The *cephalin cholesterol* and *colloidal gold tests* were both 2, just within normal limits. The *fat in faeces* was high, the total fat content of the dried faeces being 53.6 per cent, of which 23.7 per cent was unsplit, and 29.9 per cent split. The *serum calcium* was normal 9.9 mg./100 c.c. The *plasma proteins* were normal, total protein 7.7 G. per cent, albumin 4.2 G., globulin 3.1 G., fibrinogen 0.4 G. per cent. The motions were loose, occasionally putty-coloured, but usually brown and the bowels were opened six to eight times in the twenty-four hours. The total *serum lipids* at the end of September 1952 were considerably raised, 1,800 mg./100 c.c., the normal figure being 570 to 820 mg./100 c.c. *X-ray of the spine* showed slight decalcification of the dorsal vertebræ. The *cholecystogram* showed a non-functioning gall-bladder which failed to fill.

During the period of the fever no abnormal signs were found in the lungs, and *X-ray of the chest* showed no abnormality.

Mrs. F. was given a high protein, low fat diet, but her progress was very disappointing. She also had Sorlate 0.5 G. capsules, 6 capsules t.d.s. to aid fat absorption, methionine 5 G., and cystin 5 G. a day, Befortiss 1 c.c. daily by intramuscular injections, and calcium lactate gr. 30 t.i.d. All with no demonstrable effect.

Mrs. F. come to see me again early in December 1952. She felt considerably better, although still deeply jaundiced. She told me that her appetite was good, and she seldom had nausea. Her weight (clothed) was 7 st. 4 lb., 2 lb. lighter than in March 1952. The motions were rather loose, two or three in the twenty-four hours, but normal in colour, the urine was dark orange in colour and contained bilirubin. I now noticed a fresh sign on examining the patient, which I know was not present when I last examined her in hospital a few months ago, for I had specifically looked for it. Now I found it and it threw fresh light on the diagnosis. No doubt you will observe it too, Dr. P., when you examine the patient.

Early in March 1953 Mrs. F.'s doctor telephoned to say that two weeks previously the patient had tripped and fallen down, and she had suffered much pain in the lower part of the spine since then. An X-ray had been taken, and it was reported that the body of the first lumbar vertebra was fractured, and would I arrange for her to be re-admitted to hospital. And so a week later, on March 11th, 1953, two months ago, Mrs. F. came for the second time into this ward. She has been afebrile during her stay, and the X-ray examination confirmed the presence of a collapse fracture of L.1 vertebra, with generalized

osteoporosis. The orthopædic surgeon advised a sternal puncture to exclude the possibility of myelomatosis. This, however, was not carried out. He prescribed large doses of calciferol and a thoracolumbar corset.

Now Dr. P. this is a long and complicated history, but it is all important. Will you examine the patient and tell us what is the cause of the jaundice?

* * * * *

Q. What do you find?

A. The patient is a small, thin woman, about 5 ft. high.

Q. Her height is 5 ft. $1\frac{3}{4}$ in., and she weighs now only 6 st. 9 lb. in pyjamas. Go on.

A. She looks ill and is deeply jaundiced. The conjunctivæ are bright yellow, but her skin generally is more brown than yellow. There are some small dark brown spots on the trunk and limbs.

Q. Yes, there is hyperpigmentation and melanosis. What does this dark colour suggest?

A. That the jaundice has been present for a long time.

Q. Does it suggest malignant disease?

A. No. I think with malignant disease causing obstruction of the bile ducts, the jaundice tends to be more green.

Q. What else did you find?

A. The tongue is slightly furred, there is a partial upper denture. I felt no enlarged glands. The heart is not enlarged, there are no murmurs. The brachial arteries are not thickened. The blood pressure is 130/80 mm. Hg. The lungs are normal. There is a mid-line upper abdominal operation scar, soundly healed, where the exploratory laparotomy was made. The liver is palpable 2 in. below the right costal margin; it is firm but not tender. The spleen is not palpable. There is no abdominal distension, no ascites, and there are no enlarged veins in the abdominal wall.

Q. Is there a venous hum over the liver or xiphoid cartilage?

A. I did not listen for it.

Q. Well, will you.

Dr. P. listens and says there is no venous hum.

Q. You may have read the case of venous hum which we had in this ward, and which I described in "Applied Medicine." The patient was thought to be suffering from Banti's disease. Have you examined the legs?

A. Yes. They appear normal and the knee-jerks are present.

Q. Have you seen the urine?

A. Yes, it is very dark brown with a slight greenish shimmer. Bilirubin is present. There is no sugar, but a trace of albumin.

Q. Did you enquire about the colour of the motions?

A. Yes. They were putty-coloured on admission and once or twice since, but they are usually brown.

Q. Does that complete your examination? You are sure you are not keeping anything back?

A. No. I have mentioned everything I noticed.

Q. Would you like to know what the laboratory examinations have shown during the two months she has been in hospital?

A. Yes, please.

Q. I will get the clerk to read them out, he has them arranged in chronological series which makes them easier to follow. Mr. S., let us have the tests.

Mr. S. reads as follows:—

Blood counts: On admission: Red cells 3.9 millions per c.mm., Hb. 72 per cent, C.I. 0.9, White cells 6,500 per c.mm., differential count normal. Subsequently, Red cells 3.6 millions, Hb. 60 per cent. Red cells 4.3 millions, Hb. 68 per cent. The patient now was transfused with $\frac{3}{4}$ pint of whole blood, when the vein became obstructed. The Hb. is now 88 per cent, after a further transfusion of red cells from 3 pints of blood.

Blood proteins: Total protein 7.6 G./100 c.c., albumin 4.2 G./100 c.c., globulin 3.1 G./100 c.c., fibrinogen 0.3 G./100 c.c.

Serum bilirubin: 8.4 mg./100 c.c.; 7.0 mg./100 c.c.; 13.0 mg./100 c.c.; 24 mg./100 c.c.

Alkaline phosphatase: 100 units (King-Armstrong)/100 c.c.; 97 units/100 c.c.; 96 units/100 c.c.; 68 units/100 c.c.; 50 units/100 c.c.

Serum cholesterol: 810 mg./100 c.c. (cholesterol esters 240 mg., free cholesterol 570 mg./100 c.c.); 780 mg./100 c.c.; 540 mg./100 c.c.; 630 mg./100 c.c./600 mg./100 c.c.

Serum calcium: 8.8 mg./100 c.c. on admission.

Serum: Clear. Yellow.

Fat in faeces: Total fat 45.5 per cent dried faeces. Unsplit fat 8.0 per cent, split fat 37.5 per cent.

Sedimentation rate of red cells (Westergren): 67 mm./1 hr.; 60 mm./1 hr.; 64 mm./1 hr.; 62 mm./1 hr.; 70 mm./1 hr.

Calcium, nitrogen and fat absorption: The calcium balance and the nitrogen balance were both positive. There was poor fat absorption, 64 per cent being absorbed, but it was well split.

Q. Thank you. You will see there was a severe anæmia, which required treatment by transfusion, and the alkaline phosphatase, bilirubin, cholesterol and sedimentation rate were all high. Now you have all the evidence, or nearly all, what do you think, Dr. P., is the cause of the jaundice?

A. I think the jaundice began with an attack of infective hepatitis,

and that the liver, instead of recovering as it usually does, has developed cirrhotic changes, and there is now an intrahepatic biliary obstruction.

Q. That certainly would appear to be the most likely diagnosis—post-infective hepatitis cirrhosis, and yet it is not so. Such cases have been described, and I have seen them. They may lead to œsophageal varices with repeated hæmatemeses which may eventually prove fatal. As I said earlier, in the history, a portion of liver was removed at the exploratory laparotomy, and we have received the report on it. It showed fibrosis and inflammatory changes of the bile ducts, with normal liver cells. What histological changes occur in the liver in infective hepatitis?

A. The cells around the central vein of the lobule are chiefly affected. The cells of the liver lobules undergo necrosis and autolysis, and areas of rarefaction may be seen around the central veins as the liver cells disappear. There may also be proliferation of the bile ducts in the portal tracts.

Q. Later, in some cases, there are areas of fibrosis or a permanent cirrhosis. The changes found on microscopical examination of the liver in this case were not those of infective hepatitis, but they are compatible with a diagnosis of biliary cirrhosis. What do you mean by biliary cirrhosis?

A. I think there is a lot of confusion about it.

Q. Yes. It was easier in the old days when we knew less about it. We then talked glibly about Hanot's cirrhosis and Charcot's cirrhosis, and that was good enough. What was meant by Hanot's cirrhosis?

A. It was described as a disease of young people but some denied its existence. There is, however, probably such a condition, characterized by persistent jaundice, not very intense, enlargement of the liver, and periodical attacks of fever. The disease is progressive and usually proves fatal in about six years.

Q. And what about Charcot's cirrhosis?

A. This is an obstructive biliary cirrhosis due to a calculus, to adhesions in the portal fissure, or to carcinoma of the bile ducts or of the head of the pancreas.

Q. This has been excluded by the laparotomy, so we are left with the possibility of what used to be called Hanot's cirrhosis or some other form of intrahepatic biliary obstruction. The term usually applied to biliary intrahepatic obstruction now is cholangiolitic biliary obstruction. There has been considerable interest taken in biliary cirrhosis recently, and it is often subdivided into primary and secondary. What is the difference between them?

A. Primary biliary cirrhosis means that the obstruction is within

the liver, secondary biliary cirrhosis indicates the biliary obstruction is extrahepatic.

Q. I have a paper here on primary biliary cirrhosis. Perhaps you would like the reference, Dr. W. You generally appear interested in my attempts to entertain or instruct you. Here it is: E. H. Ahrens, M. A. Payne, H. G. Krinkel, W. J. Eisenmenger and S. H. Blondheim, *Medicine*, 1950, **29**, 299. Apart from the laparotomy findings what are



FIG. 47. Elbows showing xanthoma tuberosum.

the clinical features in this case which are opposed to a diagnosis of extrahepatic biliary obstruction?

A. There has been no pain suggestive of cholecystitis or of biliary colic.

Q. Correct. And what else?

A. There have been no rigors and only one feverish attack, and the patient has not found that fat upsets her, although the doctors have restricted her fat intake.

Q. Did you ask her that?

A. Yes.

Q. Are you suggesting we were unwise to put her on a low fat diet?

A. I do not think that the ordinary amount of fat would do her any harm.

Q. Perhaps you have overlooked one point which we will come back to. Now, Dr. P., I want you to look at the patient again, a little more carefully if you please, doctor, than you did before, and perhaps you will notice something which will give you the clue to the diagnosis.

Dr. P. looks at the patient's face, the front of the arms, the backs

of the hands, the trunk and the front of the legs. He sits the patient up and looks at her back.

We watch him as he looks everywhere except where he should.

Q. What have you found?

A. Nothing more, I am afraid.

Q. That is because you have not looked everywhere. Ask the



FIG. 48. Hand showing xanthoma planum.

patient to bend her arms and look at the back of the elbows. What do you see?

A. Some little nodules or papules in the skin. They are buff-coloured. They vary in size from about 1 mm. to about 10 mm. in diameter. There are more on the left elbow than on the right.

Q. How many are there?

A. I do not know. I have not counted them.

Q. Some are very minute, but roughly there are 26 on the left elbow and 14 on the right (see Fig. 47). Now look at the palms of the hands.

A. There are some buff-coloured marks on the creases of the fingers and some yellowish-white patches on the palms. The marks are more obvious on the distal interphalangeal creases, where they are slightly raised and about 2 mm. wide. On the palms of the hands there are many irregularly shaped whitish-yellow areas of skin (see Fig. 48).

Q. Now look at her eyelids—they show the well known wash-leather slightly raised patches. As you did look at the flexures of the elbows you should have seen a similar raised elongated patch about 1.5 cm. long over each anticubital vein, at the site of venepuncture. It is curious how these have come at the site of trauma. I have not seen this described before and it may account for the papules occurring on the elbows. There are also one or two patches you have overlooked; there are some papules at the back of the neck, at sites where she has been scratching, and one or two on the dorsum of each foot. Perhaps you will remember when I was reading the history I told you that when I examined the patient five months ago I found something, for which I had been looking before, which established the diagnosis. And this something was these skin lesions. Now Dr. H., perhaps you will tell us what these skin lesions are.

A. They are xanthomatous lesions.

Q. Yes. We discussed a case of bony xanthomatosis in a man, a year or so ago which I also described in "Applied Medicine". The xanthomatous lesions are characterized by the presence of large foamy degenerated cells which contain cholesterol. As I said before, Thannhauser divides xanthomatous disorders into two main groups, hypercholesteræmic, with a high blood cholesterol content, and normocholesteræmic, with a normal blood cholesterol. The xanthomatosis of bone which I showed you before, belongs to the latter group. We know that our case today has hypercholesteræmia. What are the lesions on the eyelids called, Dr. H.?

A. Xanthelasma palpebrarum.

Q. Yes, but in 1835 they were described by Dr. F. P. Rayer as *plaques jaunâtres des paupières*. I trust you can understand my French, if not Dr. W. will pronounce it for you. What are the papular lesions on the elbows called?

A. Xanthoma tuberosum.

Q. They are also often found on the buttocks and on the backs and sides of the legs. They are said never to occur in the axilla, flexure of knee or flexure of elbow, but as you see in our patient they occur in the flexure of the elbow following venepuncture. What are the lesions called in the palms?

A. Xanthoma planum.

Q. You may or may not remember that when xanthoma planum

is found in the palms, it is said always to be associated with liver disease. Also in cases of xanthelasma palpebrarum, if the blood cholesterol is above 300 mg./100 c.c. it is said to indicate that the xanthomatous lesions are generalized. Where else may xanthomatous lesions occur on the surface of the body?

A. On the tendons, especially on the tendo Achillis and on the backs of the hands.

Q. We know now that this patient is suffering from hypercholesteræmic xanthomatosis with jaundice, so there can be no doubt that she has the condition known as xanthomatous biliary cirrhosis. I have been looking out for it for many years—but this, I think, is the first time that I have diagnosed it. Dr. S., do you know when this condition was first described and by whom?

A. I believe Addison described it at Guy's.

Q. Yes, that is right. Addison and Gull in 1851. I have their paper here, in the New Sydenham Society Edition of Addison's works, published in 1868, which I bought in the Charing Cross Road many years ago, when I was medical registrar here. I will tell you briefly what they say. They call the skin lesions vitiligoidea plana and tuberosa. They say they vary in size from a pin's head to a large pea, they may be isolated or confluent, they are yellowish with an irregular outline. If you look at the lesions on the right elbow of our patient you will see some of the papules are confluent. They then describe the case of a woman, forty-two years of age, who had been jaundiced for two years, with much pain about the right hypochondria. "After the jaundice had lasted fourteen months a change began in the integument, about her eyelids, and in the palms of the hands and flexures of the fingers. The skin was at this time of a lemon tint. The affection of the eyelids consists of patches of a light opaque colour, with the surface and edges slightly raised, extending from the middle of the upper lid inwards around the inner canthus, and then outwards along the lower lid to nearly the same extent. The palms of the hands are of an olive-brown; along the ridges on either side of the flexures, both of the palms and fingers, there is the same opaque yellowish discolouration. The morbid change is situated in the cutis, which is rather thickened, altered in colour and has increased sensibility." The patient died four years after the onset of the jaundice. Dr. S., if you will test the skin lesion with a pin prick you will confirm Dr. Addison's observation that the lesions are more sensitive to pin prick than is the surrounding skin. Is that so?

A. Yes.

Q. There are several interesting points about this disease. All the cases described have been in adult females except one—a girl aged seven years. If you want the reference, here it is: F. K. Herbert,

Arch. Dis. Child., 1943, **18**, 41. It is said that in the cases previously described, there is no previous history of hepatitis. If this is so our case appears to be an exception, for there seems little doubt that she had an attack of infective hepatitis eleven years ago, which cleared up completely. Thannhauser drew attention to a small group of patients suffering from primary biliary obstruction, who developed xanthomatosis. To this group our case clearly belongs. He called the condition xanthomatous pericholangiolitic biliary cirrhosis. S. J. Thannhauser, in the first edition of his book "Lipidoses," published in 1940, considered the liver changes were due to xanthomatous involvement and partial obstruction of the large bile ducts, but subsequent autopsies have shown that there may be no changes in the larger bile ducts. The bile stasis may only occur in the interlobular bile capillaries and in the liver cells. In the second edition of his book, published in 1950, Thannhauser therefore considers the condition is a primary liver disorder with secondary skin lesions, atheroma of arteries and sometimes atheromatous changes in the bile ducts. There is no other condition in which the cholesterol and lecithin reach such high values, and it is suggested that the cholesterol and lecithin are synthesized in excess in the liver cells. It has therefore an endogenous and not an exogenous source. For instance with complete biliary obstruction of the common duct, the serum cholesterol and lecithin do not rise to more than two to four times the normal, and skin xanthomata are rare. In xanthomatous biliary cirrhosis the cholesterol and lecithin figures may be considerably higher.

Now Dr. S., what essential features must be present before a diagnosis of xanthomatous biliary cirrhosis is made?

A. The jaundice varies periodically in intensity.

Q. Yes, that is so in our case.

A. The liver and spleen are enlarged, firm, smooth and there is no ascites.

Q. The spleen is not enlarged in our case.

A. Xanthoma, planum and tuberosum, are present.

Q. Yes. What about the blood changes?

A. There is anæmia and a tendency to internal hæmorrhages.

Q. Our patient has required transfusion.

A. The serum bilirubin is high, the jaundice being of the obstructive type.

Q. That is so in our case.

A. The serum cholesterol may reach 1,200 mg./100 c.c. or more.

Q. In our case the highest reading has been 1,150 mg./100 c.c. The cholesterol esters are said to be high in the early stages, up to 70 or 80 per cent; in our case these were only 30 per cent, rather lower

than the normal, which is about 50 per cent. They were only estimated once.

A. The serum lipids are increased.

Q. In our case the reading was 1,800 mg./100 c.c., more than twice the maximum normal of 820 mg./100 c.c.

A. The serum is transparent, and not creamy, because the neutral fat content is low or normal.

Q. That is so in our case. It is important as excluding other cases of hepatosplenomegaly with hyperlipæmia and secondary xanthomatosis. In these cases there is no jaundice, the serum is milky and the skin xanthomata may disappear. Any other point you would like to make?

A. The liver function tests, apart from the bilirubin test, are usually normal.

Q. What is the prognosis?

A. It is very bad, the patient may die from hæmorrhage, from cholæmia, or from coronary thrombosis due to atheroma of the coronary arteries.

Q. What treatment would you advise?

A. The blood cholesterol may be lowered a little by giving a low cholesterol diet.

Q. What do you mean by a low cholesterol diet?

A. Animal cholesterol is absorbed from the intestine, and so the patient must take no meat, no egg yolk, no butter, no cheese, no cream, no fatty fish, no lard, no suet and no ice cream.

Q. And what foods are allowed?

A. Fruit, vegetables, rice, macaroni, spaghetti, cereals, jam, sugar, bread, biscuits, olive oil, margarine, white fish, condiments, skimmed milk, etc., as plant sterols are not absorbed from the intestines.

Q. The patient was put on this diet, but did not like it and lost weight; she also felt more ill. She was therefore put back on a high protein, low fat diet. What would you do for the itching?

A. I should give barbiturates.

Q. No, surely not. You should not give barbiturates if the liver is badly damaged, and in any case they would not relieve the itching. What else would you do?

A. Apply a calamine or a coal tar lotion.

Q. What else?

A. I should try an antihistamine drug, such as Antisan or Histantin.

Q. How are they put up?

A. Antisan in mg. 100 tablets, and Histantin in mg. 50 tablets.

Q. I do not think they would stop the itching. There is one drug which has really worked in this case. What is it, Dr. J.?

A. Would it be testosterone?

Q. It not only would be, but it is. Tablets of methyl testosterone, mg. 25, chewed before swallowing, one three times a day, have given great relief. Care must be taken in the case of women. Overdosage may cause hairiness on the face and lowering of the tone of the voice. It is wise not to give the tablets for longer than a week at a time. What would you do for the osteoporosis?

A. I should inject intramuscularly calciferol, 150,000 units daily, and give calcium lactate by mouth, gr. 30 t.i.d.

Q. Is there any danger in giving too much calciferol?

A. Yes, it may cause hypercalcaemia and so frequent blood calcium estimations should be made.

Q. What are the dangers of hypercalcaemia?

A. It may lead to mental deterioration, renal failure, calcification of the cerebral arteries and cataract.

Q. You should not wait for those. What are the early symptoms?

A. Headache, I think, and nausea or vomiting.

Q. Loss of appetite is also an early symptom. And what about the lipotropic substances choline and methionine?

A. They are probably not much good as the patient has not a fatty liver.

Q. The patient has also been taking large doses of vitamin B, and Sorlate 3 G. t.i.d. to aid fat absorption from the intestines.

* * * * *

The patient left hospital at the end of May 1953, and was admitted to hospital here again for the third time at the end of July 1953 as an emergency on account of melæna. The gums were bleeding on admission, and shortly after coming into the hospital she vomited half a pint of black fluid containing blood clots. The blood count was Red cells 1·4 millions per c.mm., Hb. 27 per cent, C.I. 0·9, White cells 10,000 per c.mm. The prothrombin time was prolonged to 54 seconds, the control time being 15 seconds.

A transfusion of 4 pints of blood was given with much improvement, the Hb. reaching 55 per cent, and the prothrombin time being restored to normal. Vitamin K was also administered intramuscularly in doses of mg. 20 on alternate days. In addition calcium gluconate, 10 c.c. of a 10 per cent solution, was injected intravenously, and calcium lactate gr. 30 was given by mouth t.i.d. A further blood transfusion of 3 pints was given a week later, and when the patient left hospital the Hb. was 87 per cent. A barium swallow examination revealed no evidence of œsophageal varices, and the bleeding was presumably due to hypoprothrombinæmia.

I saw the patient again three months later. She then felt rather better and was no longer wearing her spinal corset. She could now

walk a mile a day, and was able to bath herself and to lie down in the bath. The skin was deeply jaundiced, but the urine was not quite so dark, although bilirubin was present in considerable amounts. The weight was now 7 st. 2 lb. (clothed). The superficial xanthomatous lesions remained unchanged.

A CASE OF GLUTEAL HÆMORRHAGE

THIS patient has a somewhat unusual history, which I will relate to you. He is a married man, sixty-five years of age, and a butcher. During the last week in November 1952 he attended the out-patient department at this hospital on account of pain and swelling in the right temporo-mandibular region of one day's duration. There was no facial paralysis, but he could not open the jaw fully. No diagnosis was made and he was sent away with some codein tablets. Three days later he came again and was seen by another casualty officer who diagnosed parotitis, and injections of penicillin and streptomycin were ordered. These two antibiotics were injected together into the left buttock, and five daily injections were given, all of them on the same side. The last injection was particularly painful and the patient said that the nurse inserted the needle down to the bone. Being a butcher he was familiar with the landmarks! Two days later, while standing at his chopping block drinking a cup of tea, he was suddenly seized with pain in the left buttock which shot down the leg to the ankle. The pain was so severe that he dropped his cup of tea, and he felt and saw a swelling in the gluteal region, which rapidly increased in size. The pain was very intense, so much so that he could not walk, and he was brought to hospital on the same day, December 4th. The patient was now examined by a third casualty officer who found a hard, tender and warm swelling, about the size of two oranges on the outer side of the hip, above the great trochanter. All passive movements of the left hip were very painful, and abduction of the right hip caused pain in the left hip. A possible diagnosis of spontaneous fracture of the neck of the femur was made, and the patient was admitted to a surgical ward.

We read in the surgical notes: "There is an abscess situated in the lateral and posterior part of the left thigh and buttock, 6 in. by 4 in. It is very tender and fluctuates. There is no inflammation over the area." A mass was felt in the left subcostal region, the nature of which was uncertain, but it was thought that it might be a neoplasm in the kidney or splenic flexure. The temperature was slightly raised, to just over 99° F. in the evening. No enlarged glands were palpable. X-ray examination of the left hip showed no fracture and nothing abnormal was seen. The blood count was Red cells 6·5 millions per c.mm., Hb. 111 per cent, Platelets 1·5 millions per c.mm., White cells 24,400 per c.mm., polymorphs. 74 per cent, lymphocytes 14 per cent, monocytes 4 per cent, eosinophils 5 per cent, basophils 3 per cent. No nucleated red cells. The "abscess" was treated daily by short wave

therapy. On December 10th, as there was no apparent improvement, a general anæsthetic was given and the "abscess" was opened. No pus was found, but a considerable amount of blood clot was evacuated from between the gluteal muscles. Two thin rubber drains were inserted. Examination of the abdomen while the patient was under the anæsthetic indicated that the left subcostal swelling was an enlarged spleen. It did not extend as far down as the umbilicus and its surface was irregular. After the operation there was considerable bleeding into and from the area drained, and on December 12th a transfusion was given of two pints of whole blood. The liver was now felt on inspiration, about $\frac{3}{4}$ in. below the right costal margin. There was further bleeding during the next week, and on December 14th a small vessel was ligatured in the posterior part of the wound. The patient was now showing clinical evidence of anæmia. On December 12th the blood count was Red cells 4.4 millions per c.mm., Hb. 77 per cent, Platelets 3 millions per c.mm., White cells 22,000 per c.mm., polymorphs. 70 per cent, lymphocytes 10 per cent, monocytes 2 per cent, eosinophils 13 per cent, metamyelocytes 5 per cent, myelocytes 2 per cent. By December 16th the Hb. had fallen to 45 per cent and five pints of blood were transfused on December 19th and 20th, with a consequent rise of hæmoglobin to 75 per cent. The operation wound failed to heal and discharged a thin sanious fluid, which, on culture, grew *B. proteus* and *staphylococcus pyogenes*. Both organisms were sensitive to chloramphenicol. Early in January I was asked to see the patient, and on January 17th, thirteen days ago, he was transferred to our ward.

Now Dr. S. will you examine the patient and tell us what you find.

* * * * *

Q. What about the family history?

A. His mother died of cancer, aged seventy-two. His father was killed in an accident. Two brothers died of cancer and one sister of a stroke.

Q. What is his past history?

A. He had nasal polypi removed several years ago. He has also had an operation for piles. In the 1914-1918 war he had a mild attack of dysentery, and in 1944 his appendix was removed. During the last three years he has suffered from indigestion, and he has taken between one and two pounds of sodium bicarbonate each week to obtain relief from the pain.

Q. What do you find now?

A. He is very pale and thin. He is 5 ft. 5 in. in height and weighs 8 st. 2 lb. His usual weight is about 11 st. I can feel no enlarged glands, except a few small shotty ones in the axillæ and groins. The

heart is not enlarged and there are no murmurs. The brachial arteries are a little thickened. The blood pressure is 150/60 mm. Hg. The lungs show signs of chronic bronchitis. The liver is just palpable on deep inspiration, and the spleen is enlarged to the level of the umbilicus.

Q. The spleen is larger now than when he was admitted to the surgical ward. Did you find anything else?

A. The urine is clear, and contains no albumin, no sugar and no blood.

Q. Did you look at the wound in the buttock?

A. No.

Q. Has he any pain?

A. He says that he has very severe pain in the buttock, extending down the thigh and leg to the heel whenever a fresh bleeding occurs in the buttock. He can always tell when the bleeding takes place because the buttock and thigh swell, and the pain comes on quite suddenly.

Q. Did you see any bruises or petechiæ?

A. No.

Q. What do you think is the matter with him?

A. A bleeding tendency.

Q. What do you mean by that, hæmophilia?

A. No. I do not think so. There is no history of undue bleeding at his previous operations.

Q. What do you mean then?

A. He might have purpura.

Q. It is a very unusual way for acute purpura to start. The bleeding in acute purpura is usually into the skin or mucous membranes, or in the urine, or from the genital tract, or from the stomach or intestine. What else might the bleeding tendency be due to?

A. Scurvy.

Q. In scurvy the bleeding is usually from the gums, but it is true it may occur in the limbs, usually subperiosteally. There is no bleeding from the gums here, and there is no history of dietary deficiency which might cause scurvy. What are his teeth like?

A. I don't know.

Q. Well look at them.

A. He has only his lower central teeth and they are very dirty and decayed.

Q. Who first described scurvy in sailors? Oh, surely someone knows! Dr. W., who was it?

A. Lind, I think.

Q. James Lind was a naval surgeon, he was not the first to describe scurvy, but he introduced the use of lemon juice as a prophylactic in 1753. He said that the cause of scurvy amongst sailors was the want

of fresh vegetables and greens. He gave a good clinical account of the disease. According to his account the first sign was a pale and bloated complexion, followed by a listlessness and aversion to any sort of exercise. The knees are stiff and feeble, and there is breathlessness on exertion. Soon the gums become itchy, swell and bleed upon the gentlest friction. They are red, soft and spongy. The skin is dry, and contains red, blue or black spots from hæmorrhages, and later there is œdema of the legs. Jacques Cartier in 1534, a French navigator, described scurvy on his voyage of exploration to Newfoundland, and related how it could be cured by an infusion of the bark and leaves of the Ameda tree. Scurvy was perhaps first described in the middle ages, and occurred amongst the Crusaders in the 13th century. What else might give rise to a bleeding tendency?

A. Leukæmia, liver damage, jaundice or fibropenia.

Q. What is the bleeding tendency due to in these various conditions?

A. In scurvy it is due to lack of vitamin C, in leukæmia it is possibly due to a low platelet content in the blood.

Q. Yes, the platelets are usually low in acute leukæmia, probably owing to megakaryocyte aplasia in the bone marrow. In chronic leukæmia the platelets may be above normal. It has been suggested that bleeding is then due to absorption of material from the necrotic leukæmic lesions. What is the cause of bleeding in purpura?

A. In some varieties it is due to a low platelet content of the blood, in others the platelet count is normal, but there is increased fragility of the capillaries.

Q. How do you test for capillary fragility?

A. The arm above the elbow is compressed by the cuff of a sphygmomanometer, the pressure being kept for 15 minutes half way between the systolic and diastolic levels. A circle is marked on the forearm, 1 in. in diameter, the upper margin being 2 in. below the bend of the elbow. The cuff is removed at the end of the 15 minutes and 5 minutes later the number of hæmorrhagic spots is counted in the circle. Any number above 20 is abnormal and indicates increased capillary fragility.

Q. What is this test called?

A. The Hess test.

Q. Yes. It is also known as the Rumpel-Leede test. It was normal in this case; only 6 spots appeared. And what about hæmophilia?

A. The bleeding is due to deficiency of plasma thromboplastin. The coagulation time of the blood is much prolonged, but the bleeding time is normal, and the platelet count is normal.

Q. What is the source of thromboplastin?

A. The platelets.

Q. Yes, it has been suggested they are unusually stable and do not disintegrate to liberate thromboplastin. This view is not universally accepted, some believe the primary abnormality is not one of the platelets, but that the blood does not clot in hæmophilia because of a lack of plasma thromboplastin which normally converts prothrombin in the presence of calcium. Quick believes that thromboplastin is present in normal blood in an inactive form, thromboplastinogen, and when the platelets disintegrate they yield some substance which converts thromboplastinogen into thromboplastin. In hæmophilia blood thromboplastinogen is lacking. A third theory is that the delayed clotting in hæmophilia is due to an excess of antithrombokinase. Why is the bleeding time normal?

A. In the bleeding time test, a small prick is made with a sharp needle. There are plenty of platelets to seal over the prick wound, and there is some tissue thromboplastin available, and the capillaries which are injured contract and so the bleeding quickly ceases.

Q. What is the cause of bleeding in liver damage and jaundice?

A. Lack of vitamin K which causes deficiency of prothrombin in the blood.

Q. And what about fibropenia?

A. The fibrinogen is absent from the blood or only present in very small amounts.

Q. What is the normal amount of fibrinogen in serum?

A. About 0.22 G./100 c.c.

Q. There are two varieties of fibropenia, congenital and acquired. The acquired variety may be met with in carcinoma, and sometimes in pregnancy, biliary cirrhosis or in scarlet fever. There is one other cause of the bleeding tendency which you have not mentioned and which may be of importance here. What do you think, Dr. C., might be the cause of the bleeding in this case?

A. He might have an aleukæmic leukæmia, as the spleen is enlarged.

Q. In aleukæmic leukæmia the white cell count is not usually above normal. In this case the white cells number 24,400 per c.mm. How would you find out whether a patient has aleukæmic leukæmia?

A. By an examination of the bone marrow. It would show an excess of immature white cells.

Q. A sternal puncture has been done, but it did not show any evidence of leukæmia. What was the most striking abnormality of the blood counts?

A. The blood platelets were considerably above normal.

Q. Yes, they were 1.5 to 3 millions per c.mm., about 6 to 12 times the normal. Does this suggest anything?

A. There may be an excess of megakaryocytes in the bone marrow.

Q. Is there anything else you would like to know about the patient?

A. I should like to know what has happened to him since he has been in the medical ward and whether any more blood counts have been made, and what the bone marrow showed.

Q. All right, we will ask the house physician to tell us.

A. The H.P. says: The liver was palpable when the patient was transferred to us on January 17th, and the spleen was larger, reaching now to the level of the navel. It was firm and nodular. A few small shotty glands were palpable in the axillæ and groins but the patient was very thin and I did not think they were pathological. The blood pressure was 150/60 mm. Hg. The urine contained no albumin, no sugar and no blood. There were no petechiæ in the skin and no bruises. Fresh hæmorrhages occurred from time to time into the gluteal muscles on the left side, and on each occasion there was a very severe pain in the leg. The patient was very pale and appeared desperately ill. On January 18th the blood count was Red cells 2.5 millions per c.mm., Hb. 44 per cent, Platelets 1.75 millions per c.mm., White cells 23,300 per c.mm., polymorphs. 86 per cent, lymphocytes 9 per cent, monocytes 4 per cent, eosinophils 1 per cent. During the next few days some further tests were made. The plasma proteins were normal, total protein 5.5 G./100 c.c., albumin 3 G./100 c.c., globulin 2.1 G./100 c.c., and fibrinogen 0.36 G./100 c.c. The prothrombin time was prolonged to 21 sec., the control reading being 17 sec. The coagulation time was normal, 4½ minutes, and the bleeding time was also normal, 4 minutes. On January 24th I expressed about a pint of clot from his wound, the cavity quickly filling up with blood. To-day a further 15 oz. of clot were expressed. During the first two weeks the patient was in this ward I transfused him three times, each time with two pints of blood. The blood count now is Red cells 2.5 millions per c.mm., Hb. 47 per cent, Platelets 1.25 millions per c.mm., White cells 15,600 per c.mm., polymorphs. 93 per cent, lymphocytes 3 per cent, monocytes 1 per cent, metamyelocytes 2 per cent, myelocytes 1 per cent. The blood is normochromic.

Q. Thank you, Dr. E. Now Dr. K., what are your views about this case?

A. I think the anæmia which developed was due to the bleeding.

Q. Yes, that is probably correct. We have said that the most noticeable feature about the blood count was the excess of platelets, and in two counts there were some immature white cells, metamyelocytes and myelocytes. What do you think he might be suffering from?

A. Some megakaryocytic blood condition.

Q. We had a patient in the ward a few years ago whom we diag-

nosed as suffering from aleukæmic megakaryocytic myelosis. What do you know about this?

A. Very little, I am afraid.

Q. Well some people do not think it exists as a special entity. Aleukæmic megakaryocytic myelosis was described in 1934, it has also been called chronic non-leukæmic myelosis, or myeloid megakaryocytic hepato-splenomegaly. What further investigations do you want to decide whether this patient has an aleukæmic myelosis?

A. An examination of the bone marrow.

Q. This will show whether there is a condition of leukæmia present. The excess of white cells in the blood is opposed to a diagnosis of aleukæmia. There is one other point, in all conditions of myelosis or of myelosclerosis the peripheral blood shows a leuco-erythroblastic anæmia. What are the characteristics of leuco-erythroblastic anæmia?

A. The white cells are increased, with some immature white cells present, and nucleated red cells are also seen, usually in amounts up to 20 or 40 per 100 white cells. There are no nucleated red cells present here.

Q. This is very opposed to a diagnosis of myelosis. A sternal puncture has been done and this is the result:—

RED BONE MARROW EXAMINATION

TOTAL NUCLEATED CELL COUNT (20,000–100,000) 75,000 c.mm.
 MYELOID/ERYTHROID RATIO (2 : 1–8 : 1) 2.5 : 1

HÆMOCYTOBLAST (0–1)	= — %	MYELOBLAST (0–2.5)	= 2 %
PROERYTHROBLAST (0–4)	= 0.7 %	PREMYELOCYTE (·5–5)	= 6.3 %
EARLY NORMOBLAST (0–2)	= 3.3 %	MYELOCYTE (2–9)	= 12.6 %
INTERMEDIATE „ (4–15)	= 7.4 %	METAMYELOCYTE (2.5–14.5)	= 10.7 %
LATE „ (7–19)	= 14 %	POLYMORPHONUCLEAR	
EARLY MEGALOBLAST	= — %	(20–55)	= 25.7 %
INTERMEDIATE „	= — %	EOSINOPHIL	= 6 %
LATE „	= — %	LYMPHOBLAST	= — %
MEGAKARYOCYTE	= 2 %	LYMPHOCYTE (5–20)	= 5.3 %
PROMEGAKARYOCYTE	= 0.7 %	MONOCYTE (0–5)	= 2 %
MEGAKARYOBLAST	= 0.6 %	PLASMA CELL (0–1)	= 0.7 %

What do you think of this?

A. There is no evidence of leukæmia. The megakaryocytes and their precursors are increased.

Q. The chief abnormalities in this case therefore appear to consist in the increase of the megakaryocytic series in the bone marrow, the excess of platelets in the blood and the hæmorrhage. There is a slide under the microscope showing the excess of platelets in the blood if any of you care to look at it (see Fig. 49). The thick layer of platelets with a thin layer of white cells lying above the sedimented red cells, is shown in the tube of oxalated blood when it has been standing for twenty-four hours. A control tube of normal blood is put up by it

(see Fig. 50). Under what conditions does an excess of platelets occur in the blood?

A. In polycythæmia vera and sometimes in chronic myeloid leukæmia.

Q. What else?

A. There is usually an increase in the blood after splenectomy.

Q. Yes. An increase may occur temporarily after any operation,

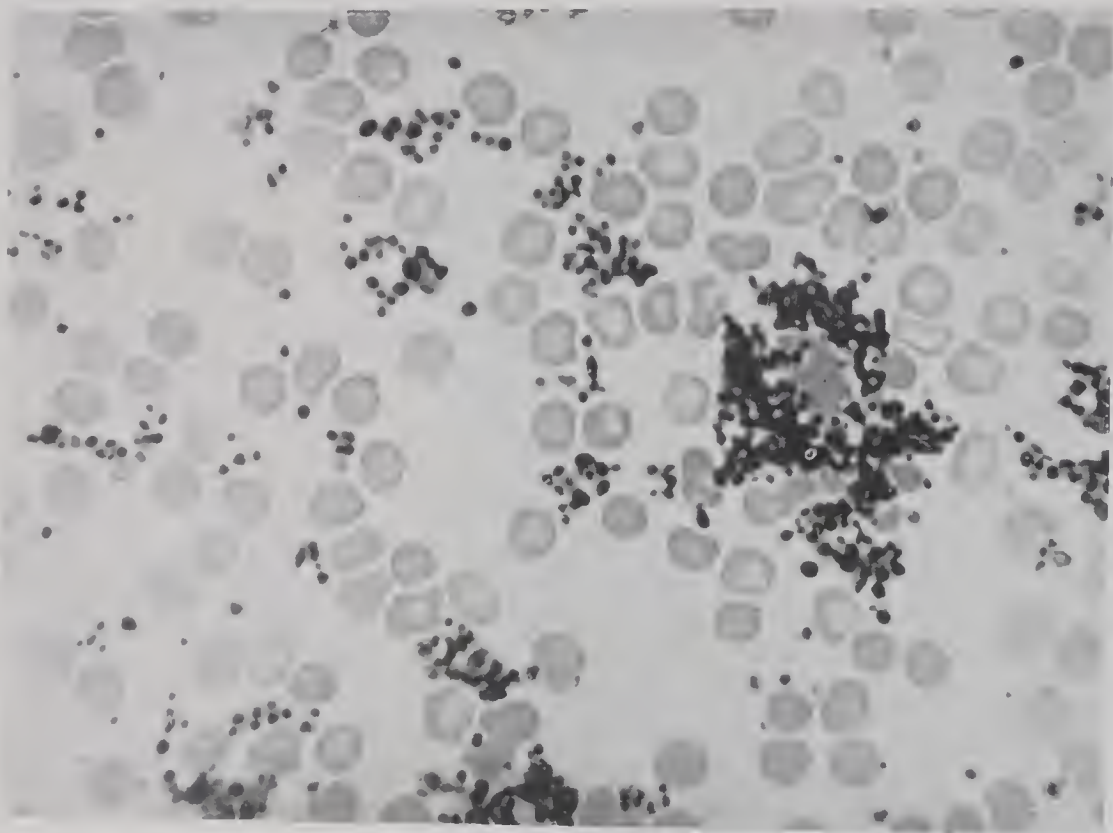


FIG. 49. Blood film showing excess of platelets. $\times 750$.

after childbirth, after hæmorrhage and occasionally in pneumonia. Do you know any other causes?

A. Thrombocytosis has been described in chronic pulmonary tuberculosis.

Q. Yes, and in rheumatic fever and Hodgkin's disease. There is one other rare, but perhaps important condition, which is thought to be due to a primary bone marrow disease, the bone marrow producing an excess of platelets, comparable with a leukæmic condition. Does anyone know what it is called. Dr. W., what do you say, you always know the answers?

A. Hæmolytic thrombocythæmia.

Q. There, I said so! What do you know about it?

A. Not very much. It is thought to be very similar to leukæmia and to polycythæmia vera, a sort of malignant disease of the marrow in which the megakaryocytes are affected.

Q. There is a good review of the subject by O. Mortensen in the *Acta Medica Scandinavica*. If any of you want to look it up the reference is 1948, **129**, 547. Mortensen says that the essential features of the disease are a permanently increased number of thrombocytes in the blood, hæmorrhages, an increase in the number of megakaryocytes in the bone marrow, neutrophil leucocytosis in the blood, in some cases with eosinophilia, enlargement of the spleen and a few immature white and red cells in the blood. The bleeding time is usually prolonged.

In our case all these features were present, except for immature



FIG. 50. Oxalated blood, after standing for twenty-four hours. Tube on left shows layer of platelets with some white cells below. Tube on right is normal blood, showing thin layer of platelets and white cells.

red cells in the blood and a prolonged bleeding time. Further, there was no history of previous hæmorrhages and the only hæmorrhage was in the gluteal region where the injections had been given. Sorensen says that in about half the cases there is gastro-duodenitis with hæmorrhage. In this case the symptoms pointed to a gastric ulcer, but there was no hæmatemesis. In some cases the number of thrombocytes and of megakaryocytes has been reduced by X-ray treatment and this appears to be the only treatment which holds out a hope of improvement.

The hæmatologist who reported on the blood and bone marrow

examinations in this case wrote: "I think that the descriptive diagnosis of hæmorrhagic thrombocythæmia is the best at present." I have asked the radiotherapist to see if he thinks deep X-ray treatment is advisable.

There are certain strange features about this case which you must have noted. What was the nature of the swelling in the parotid region? Was it due to a hæmorrhage? Did the intramuscular injections act as the exciting cause of the gluteal hæmorrhage? If so, was it because an artery was injured? Did the spleen enlarge rapidly? And if so, why? Would the disease have shown itself by now if the patient had not been ordered the injections? These and other questions may or may not be solved later.

* * * * *

The patient was transferred to the radiotherapy ward, but died after a few treatments, developing a terminal bronchopneumonia.

The post-mortem examination showed that the site of the hæmorrhage was a cavity 6 in. in its greatest diameter, and containing 9 oz. of infected blood clot. The floor of the cavity was formed by the gluteus minimus and pyriformis muscles, and the roof by the gluteus medius and a portion of the gluteus maximus. The sciatic nerve with the inferior gluteal artery and veins formed the infero-medial wall (see Fig. 51). Ante-mortem thrombus was present in the gluteal veins, and branches of the superior gluteal artery traversed the cavity. Sections showed the cavity was lined by very vascular granulation tissue and necrotic muscle-fibres. There were collections of inflammatory cells in the perineural sheath of the sciatic nerve. Pressure of the effused blood undoubtedly accounted for the severe sciatic pain. There was a circular chronic ulcer 1 in. in diameter on the lesser curvature of the stomach, 3 in. from the pylorus, with several obliterated vessels in its wall. The spleen was enlarged, weighing 15 oz. (average normal weight 4 oz.). It contained several areas resembling red infarcts over its surface, and some raised nodular circular areas. All the nodular areas were found on microscopical examination to be infarcts. The liver was enlarged and weighed 75 oz. (average normal weight 50 oz.). On section it showed congestion and early fibrosis in the centre of the lobules, associated with atrophy of the liver cells in this area. One small area of necrosis of liver cells was seen, with polymorphonuclear infiltration. Ante-mortem clot was found in the left internal iliac vein. Marrow obtained from the pelvis and spine showed a general hyperplasia of the cells with numerous megakaryocytes containing from 3 to 15 or more nuclei. A terminal bronchopneumonia was present, with early abscess formation of the whole of the left lower lobe.

The pathological diagnosis was myeloid megakaryocytic hyperplasia, and the pathologist concluded that the findings were compatible with what is known of hæmorrhagic thrombocytosis. Further, there was no evidence of leukæmia. The bleeding was probably excited

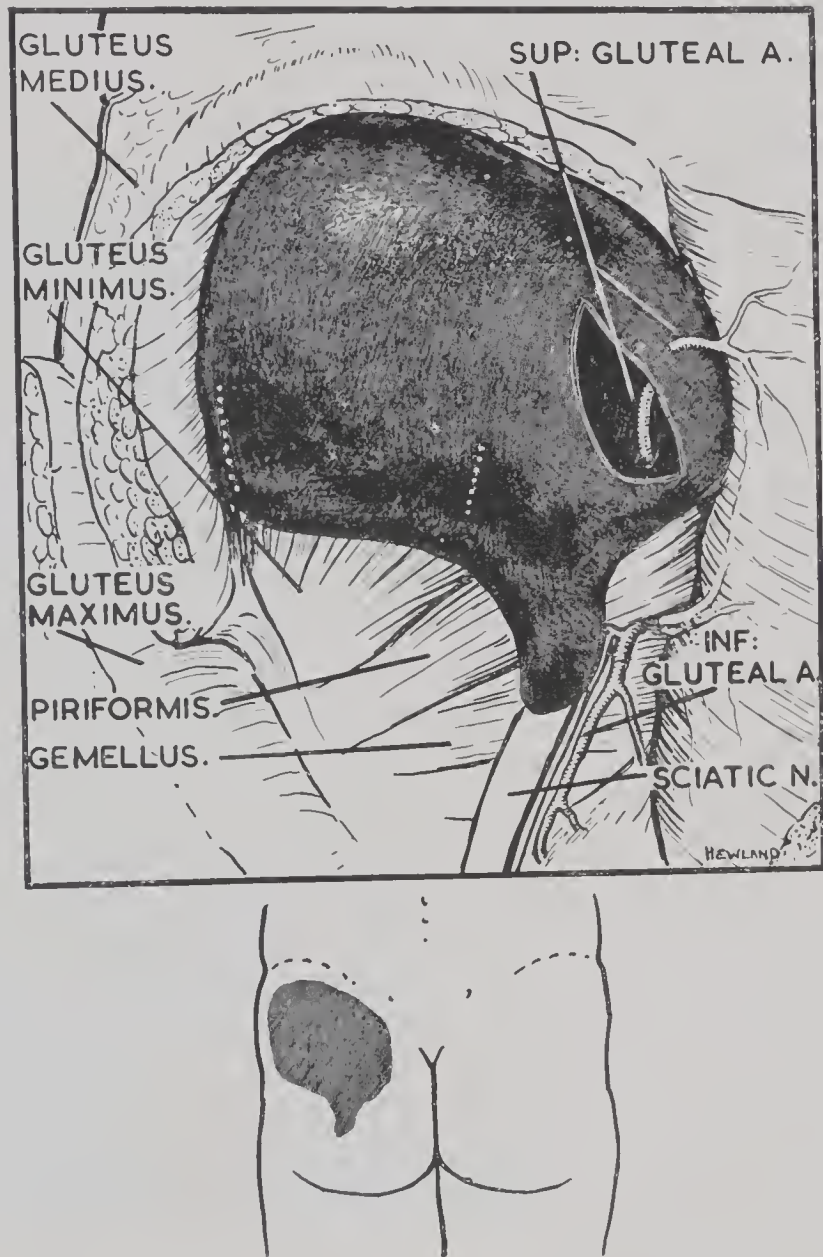


FIG. 51. Diagram showing hæmatoma sac after reflection of gluteus maximus and medius muscles. Gluteus minimus lies deep to the sac. White dotted lines show operation incision into sac. Portion of wall of sac has been removed to expose superior gluteal artery.

by the injections which may have produced muscular necrosis. If the intramuscular injections had not been given it is likely that bleeding would have occurred elsewhere, possibly in the gastric ulcer.

A CASE OF HOARSENESS

THIS patient, a married man of forty years, was sent to the out-patient department here by his doctor for treatment. The doctor wrote that the patient had recently become hoarse, that he had been examined at a hospital for diseases of the throat, that the blood had been tested, and an X-ray taken of the chest. I expect you can make a provisional diagnosis now as to the cause of his hoarseness.

The history is that about nine or ten weeks ago the patient had a cold and a slight sore throat, and during the next ten days his voice became hoarse until he could only speak in a whisper. The voice has improved but is not normal. He also found difficulty in swallowing solid foods, which made him choke, as the food went the wrong way. Fluids gave no trouble. With the catarrhal stage at the onset of the illness pain was noticed in front of the left ear, extending down the left side of the neck and to the left deltoid region. There is nothing in the past history of any importance, beyond several operations on the left mastoid.

Dr. M., will you examine the patient, and see what you find.

* * * * *

Q. Have you finished your examination now and done everything you want to do?

A. Yes.

Q. Then tell us about the patient. Does he look well?

A. Yes, he looks very well and has a good colour.

Q. Is his voice normal?

A. Yes.

I ask the patient if he thinks his voice is normal, and he says "No, I cannot speak loudly." When he tries to talk as loudly as possible his voice lacks timbre and volume.

Q. What else have you found?

A. He is not wasted at all.

Q. We must remember this. What else have you found?

A. He has lost his right leg below the knee.

Q. What was it due to?

A. Diseased bone, at the age of eight.

Q. That is not what he told me. *To the House Physician:* What was the reason for the amputation?

A. A congenital mal-development of the leg.

To Dr. M.: Is there any wasting of the right thigh?

A. I did not examine it.

Q. That is bad. What else have you found?

A. There are some nodules on the radial side of the left forearm.

Q. What are they?

A. I am not sure.

Q. Dr. G., what are they?

A. Lipomata or fibromata.

Q. Why are they not neurofibromata?

A. They are not in the line of the nerves.

Q. Oh, I think they are. Why are they not neurofibromata, Dr. P.?

A. Because they are not tender, there is no "pins and needles" sensation on pressing them, and there is no pigmentation.

Q. Yes, I think they are lipomata. Have you examined the cranial nerves, Dr. M.?

A. Yes. There is slight horizontal nystagmus to both sides, but more to the right.

Q. Is this important?

A. Yes. It means there is some cerebellar condition.

Q. Not necessarily. What else about the cranial nerves?

A. The pupils are equal and react. The fundi are normal. There is no facial weakness. There is no sensory loss on the face. The tongue does not deviate properly to the right. There is weakness of the left side of the palate. The patient is deaf on the left side, but he has had several mastoid operations. There is slight weakness of the left masseter.

Q. The left side of the palate is paralysed and hyperalgesic. The left masseter is weak and wasted. Did you test the pterygoids?

A. Yes.

Q. How?

A. I tried his power of opening and closing the mouth.

Q. Did you test his power of moving the jaw from side to side?

A. No.

Q. You should have. There is no pterygoid weakness. What else have you found?

A. There is no enlargement of the lymph glands or of the spleen, and no evidence of upper thoracic tumour or goitre. There is no dullness over the sternum. There is no motor defect in the rest of the central nervous system. Sensation is normal. The pyramidal reflexes are normal. The blood pressure is 136/85.

Q. Have you examined the heart?

A. No.

Q. Have you examined the lungs?

A. No.

Q. Did you examine the abdomen beyond feeling for the spleen?

A. No.

Q. Have you examined the urine?

A. Not yet.

Q. Very reprehensible! Don't you think so, Dr. R.?

A. I don't know what reprehensible means.

Q. Oh, don't you. Where do you come from?

A. Turkey!

Q. But you did say, Dr. M., that you had completed your examination. What is your diagnosis?

A. A pyogenic infection of bone.

Q. Do you mean an osteomyelitis?

A. Yes.

Q. Where?

A. In the middle cranial fossa on the left side.

Q. What bone is affected? The sphenoid?

A. No. I don't think so.

Q. Why did you think there is an osteomyelitis?

A. Because of the repeated mastoid infections.

Q. Well, what do you think is the diagnosis?

A. Osteomyelitis of the mastoid, tracking down the soft tissues of the neck and involving the recurrent laryngeal nerve.

Q. Now let us go back to the beginning. You remember the history of the hoarseness, the examination of the blood, and the X-ray of the chest. What do you imagine was the diagnosis when the patient was sent to us from the throat hospital?

A. I should think it was an aneurysm with a positive Wassermann reaction and recurrent laryngeal nerve palsy.

Q. That is so, but we have found the Wassermann reaction completely negative, and there is no clinical or X-ray evidence of aneurysm. A diagnosis of something in the neck affecting the recurrent laryngeal nerve would not explain the other cranial nerve lesions you have found. I think you had better have a rest now, and we will ask someone else.

Dr. P., will you look at the patient and see what you find.

Dr. P. examines the patient and says: The tongue movements are normal. I think there is slight facial weakness on the left side.

Q. Dr. G., what has been overlooked?

Dr. G. examines the patient and says: The sternomastoids are normal.

Q. No. We don't quite agree with this; there is wasting of the clavicular part of the left sternomastoid. What do you find, Dr. F.?

Dr. F. tests the arms and says: Co-ordination is normal. There is no dysdiadokokinesis. Flexion, extension and grip are good. The tendon reflexes are brisk. Cutaneous touch sensation is normal.

Q. Now, Dr. C., look at the patient's chest from the foot of the bed. What do you see?

A. The left shoulder is thinner.

Q. Yes. There is obvious wasting. Now examine the patient. What do you find?

A. There is wasting of the whole of the left trapezius, possibly of the left rhomboideus minor, of the left deltoid, of the clavicular portion of the left pectoralis major, and of the left masseter.

Q. This means probably an involvement of the left C. 3, 4 and 5 roots in addition to certain cranial nerves on the left side. The pain at the onset of the illness was in the region of the left C. 3 and 4 cervical roots. This is a most important observation which was overlooked until the patient had been in hospital for several days. It indicates that the case is not one merely of bulbar palsy. The laryngologist has examined the patient. The left vocal cord is paralysed, and is in the cadaveric position. The improvement in the voice is due to the right cord coming over to approximate to the left cord. There is evidence of affection here of the left V, IX, X and XI cranial nerves and of the left C. 3, 4 and 5 roots. Further, there is tenderness in the neck over the upper cervical nerve roots on the left side. There are one or two other points which should have been found out on taking the history. Well, we'll come back to you again now, Dr. M. What else might you have asked him?

A. If he has ever had venereal disease.

Q. He says that he has never had venereal disease. Now, Dr. M., will you tell us what are the causes of left recurrent laryngeal paralysis.

A. Tumours of the mediastinum. Enlargement of the left auricle. An aneurysm. Left apical pleurisy. Mediastinal abscess. An enlarged thyroid.

Q. What is the most common cause of bilateral vocal cord paralysis. Does no one know? Carcinoma of the œsophagus. What other causes are there in the thorax of recurrent laryngeal nerve paralysis?

A. Pleural or pericardial effusions.

Q. And in the neck?

A. Carcinoma of the thyroid or enlarged cervical glands. Neuritis due to diphtheria or lead poisoning. Trauma to the nerve at a thyroidec-tomy operation.

Q. Now let us start at the top. What cortical lesion will cause paralysis of a vocal cord?

A. The lesion must be bilateral.

Q. Yes, as tracts pass from each side of the cortex to each vocal cord. A bilateral cortical lesion would not explain the various nerve lesions in this case. What about mid-brain lesions?

A. The cranial nerve lesions in this case, the V, IX and X nuclei

might be affected by progressive muscular atrophy, amyotrophic lateral sclerosis or syringomyelia.

Q. Dr. M., did you test sensation for heat or cold in order to try and eliminate syringomyelia?

A. No, but the patient said that he felt my fingers were cold.

Q. What other possible causes are there?

A. Acute anterior poliomyelitis.

Q. Yes, and what about the commonest nerve disease?

A. Disseminated sclerosis.

Q. Did you try and find out, Dr. M., whether the patient has disseminated sclerosis?

A. I found no evidence of nystagmus, the left plantar reflex is flexor, the abdominal reflexes are present, and there has been no history of transient diplopia.

Q. What ophthalmological signs are there in disseminated sclerosis?

A. There may be pallor of the temporal half of each disc.

Q. And what else?

No answer.

The sign is known as jelly nystagmus. The fundus appears to quiver rapidly. This may be detectable before there is evidence of nystagmus externally. What other lesions should we consider?

A. Vascular lesions or tuberculomata.

Q. The lesions must presumably be multiple, and so are most likely due to disseminated sclerosis or poliomyelitis. There is no evidence of disseminated sclerosis, but it might be the cause. The history of the onset with a cold and a chill, the pain in the neck, and the multiple lesions suggest poliomyelitis as the probable cause. What other investigations would you want to support the diagnosis of poliomyelitis?

A. Examination of the cerebro-spinal fluid.

Q. What changes would you expect to find in the cerebro-spinal fluid in poliomyelitis?

A. Increase of protein and of cells.

Q. We have done a lumbar puncture, and the fluid is normal in every respect. The protein content is 30 mg./100 c.c. The Wassermann reaction is negative and the Lange curve is normal. Here is the X-ray of the chest. There is no evidence of aneurysm. The blood count is normal, and the sedimentation rate of the red cells is 7 mm./1 hour (Wintrobe). The patient has been examined by a neurologist, and he considers that the most likely diagnosis is poliomyelitis. The cerebro-spinal fluid in this case might have shown changes had it been examined at the onset of the illness. It has been suggested that the blood Wassermann reaction may be positive at the onset of polio-

myelitis, but we have no evidence to support this view. The occurrence of all the lesions on the same side of the body is, however, unusual in poliomyelitis.

An alternative suggestion has been made, that the illness is due to cervical neuritis, as there are connections between the cervical nerves and certain cranial nerves. The fact that the patient had pain in the side of the neck at the onset, and that there is still tenderness on pressure over certain of the cervical nerve roots on the left side, would support this view.

Before we go will some one tell me what is the syndrome of Avellis?

A. Paralysis of one vocal cord with paralysis of half the palate on the same side.

Q. If anyone is interested I will let him have the reference to Avellis' paper later. It is not easy to find (1). The lesion involves the nucleus ambiguus and the adjacent spino-thalamic tract. There is paralysis of the vocal cord and larynx on one side, loss of pain and temperature sensation on the other side of the body.

And what about the oculo-cardiac reflex?

A. Firm pressure on one eyeball is said to cause slowing of the heart in normal people. When the vagus on one side is affected, with paralysis of the vocal cord, pressure on the eyeball on the same side is said not to cause this slowing of the heart.

Q. Have you ever tried this test.

A. No.

Q. I think it is very doubtful whether there is anything in it. There are so many factors which may affect the rate of the heart. At any rate it did not come off in this case. I tested the patient one day and found the resting pulse rate 119. Pressure on the right eye caused the pulse to slow to 114, and pressure on the left eye, on the affected side, slowed the pulse to 112.

* * * * *

The patient was re-examined a week later. The left side of the palate had now almost recovered its mobility, but the left vocal cord was still paralysed.

Reference

1. AVELLIS, G. (1902). *Klin. Wschr.*, **40**, 1.

A CASE OF WASTING AND WEAKNESS

DR. K., you come from St. — Hospital I believe. Before you examine this patient I will ask the clerk to favour us with his history.

The clerk reads: Mr. S. is sixty-eight years of age. He had measles as a child. He was quite well until two and a half years ago, when returning from a holiday by motor coach, he felt faint and had an urgent desire to pass water. He was too shy to ask the driver to stop, but after a little while his wife did so. After passing water, he felt very short of breath and then collapsed by the roadside, but did not lose consciousness. He was taken in the coach to a nearby village, where he rested in an inn while an ambulance was sent for. He was admitted to hospital at the nearest town, where a diagnosis of coronary thrombosis was made, and he remained in hospital for two months.

On returning home he resumed work as a factory manager and was fairly well, apart from occasional attacks of giddiness brought on by walking. Two years ago he had what was thought to be another heart attack. He woke at 1 a.m. with severe dyspnœa, which lasted three-quarters of an hour. There was no pain and he returned to work the same morning. Since then he has not had any more heart attacks. About this time, when in the bath, the patient noticed the end of his second left toe was discoloured. Later it began to be painful on walking, and, shortly after, the terminal phalanx of the toe was amputated in another hospital. He has been losing weight for the last four years, about 4 st. in all. He has felt ill for six or seven months. He complained during this time of an acid taste, and occasionally regurgitated dark yellow fluid, containing the remains of the preceding meal. About seven weeks ago he fainted when he was in the "toilet," and has been in bed since then. He has a fairly good appetite, and has never suffered from indigestion.

Dr. K. now examines the patient.

* * * * *

Q. What does Mr. S. complain of now, Dr. K.?

A. General weakness. Getting up three or four times at night to pass water. Difficulty in remembering things. A bad taste. Loss of weight.

Q. What did you find on examination?

A. He is lying quietly in bed. He is still and listless and has no great desire to be talked to. He is pale. His lips and conjunctivæ are pale. His skin hangs loosely on him, and he has clearly lost a lot of weight. The nails are ridged. There are no enlarged glands. The

jugular venous pressure is not raised. The pupils are small and react normally. The tongue is normal.

Q. What do you mean by normal? Look at it again.

A. There is a central white fur. It is moist. It is slightly pale. There is no wasting. It is protruded centrally. There are no fibrillary tremors. It is not deeply fissured. It is smooth at the tip and edges. It is not sore. There are a few red spots on the left border, which fade on pressure.

Q. That is better. What else did you find?

A. The throat is normal. The tonsils were removed as a child. He has no teeth of his own, and wears dentures. The trachea is displaced to the right. The chest is asymmetrical, the left side is flat and the right prominent. There is less movement on the left side.

Q. Did you test for tactile fremitus?

A. No.

Q. Well, will you do so.

A. Tactile fremitus is reduced on the right side. The breath sounds are vesicular on both sides. There are no adventitious sounds.

Q. Why is the trachea displaced to the right?

A. There is fibrosis of the right lung.

Q. Dr. C., will you examine the chest and see if you confirm these findings.

A. I think the trachea is central. There is no kyphoscoliosis, but the right ribs are prominent in front. The percussion note is resonant all over and there are no adventitious sounds.

Q. Do you think there is any fibrosis of the lungs?

A. No. I think they are normal.

Q. I agree. What else do you find, Dr. K.?

A. The heart is not enlarged.

Q. Where is the apex beat?

A. I could not localize it.

Q. Try again. It is quite easily palpable and in the normal position. What else did you find?

A. There is a systolic murmur at the apex. The sounds are normal at the base. There are occasional premature systoles.

Q. What is the rate?

A. It is slow.

Q. Did you count it?

A. No.

Q. Count the pulse.

A. It is 74 and regular. The arteries are firm.

Q. Do you mean they are thickened?

A. Yes.

Q. Has he arteriosclerosis?

A. Yes.

Q. What type of arteriosclerosis?

A. I only recognize one type.

Q. That makes it simple. Which one do you recognize? The arterio-capillary fibrosis of Gull and Sutton?

A. I have never heard of them.

Q. That's a pity. Does anyone know anything about them?

Silence.

You should know a little about them. Gull is Sir William Gull who is also known for his papers on "Anorexia Nervosa," "On a Cretinoid State Supervening in Adult Life in Women," and for his description of "Vitiligoidea—a. Plana, b. Tuberosa," which we now call xanthoma planum and tuberosum. Gull was physician to Guy's Hospital and in 1871 looked after the Prince of Wales when he was desperately ill with typhoid fever at Sandringham. I thought we should get on to arteriosclerosis today, so I brought the report from "The Times" for December 18th, 1871, which I should like to read to you. I think it is very illuminating, it is: "In Dr. Gull were combined energy that never tired, watchfulness that never flagged; nursing so tender, ministry so minute, that in his functions he seemed to combine the duties of physician, dresser, dispenser, valet, nurse,—now arguing with the sick man in his delirium so softly and pleasantly that the parched lips opened to take the scanty nourishment on which depended the reserves of strength for the deadly fight when all else failed, now lifting the wasted body from bed to bed, now washing the worn frame with vinegar, with ever ready eye and ear and finger to mark any change and phase, to watch face and heart and pulse, and passing at times twelve or fourteen hours at that bedside." After the Prince's recovery Gull is reported to have said, "He was as well treated and nursed as if he had been a patient at Guy's Hospital." A similar remark is attributed to Sir Frederick Treves after he had operated on the same patient for appendicitis when he was then King Edward VII, the hospital in this case being The London.

Henry Garven Sutton was assistant physician to, and lecturer on pathology at, the London Hospital. That's all I know about him, except that he practised at 9 Finsbury Square.

Dr. W., you are an authority on morbid anatomy, what varieties of arteriosclerosis do you recognise?

A. Atheroma or atherosclerosis. This affects particularly the aorta and the large arteries. Yellowish-white plaques form in the intima. These may undergo fatty degeneration with the development of atheromatous ulcers.

Q. What else?

A. The arterio-capillary fibrosis of Gull and Sutton. The changes are thought to be inflammatory. The renal vessels are affected.

Q. Gull and Sutton published their paper on arterio-capillary fibrosis in the *Medico-Chirurgical Transactions*. The reference, if you want it, is 1872, 55, 272. Their conclusions were based on observations made in 60 cases. They said that in chronic Bright's disease with contracted kidney the vascular changes are more or less general throughout the body. There is thickening of the minute arteries and arterioles. Microscopically there is "hyalin-fibroid" formation, chiefly external to the muscular layer, but the intima may also be affected. The muscular coat is often atrophied. Gull said, "Bright observed the heart and kidneys, but he forgot the man between." What other varieties are there?

A. Senile arteriosclerosis affecting chiefly the medium-sized vessels. The media undergoes fatty changes and calcification and the intima is thickened, with the formation of "pipe stem" arteries. In Mönckeberg's medial sclerosis there is usually no intimal thickening, but the media is fatty or calcareous.

Q. The leg and arm arteries are affected, but the brachial arteries, according to Mönckeberg, are seldom involved. The type of arteriosclerosis we see most frequently clinically, with thickened, tortuous, locomotor brachial arteries, appears to have no eponymous designation. The changes found microscopically are not marked, some loss of elastic tissue in the media. The vessels dilate and so become tortuous. These changes are often found associated with normal blood pressure, and are not due to hypertension. Who was Mönckeberg?

A. A German, I think.

Q. Johann Georg Mönckeberg published his first paper on medial calcification and atherosclerosis in 1903 when working with Professor Eugen Fraenkel at Hamburg. He died of contracted kidneys, in 1925 at the age of forty-seven, when Professor of Pathology at Bonn, and on his tombstone in the Ohlsdorfer cemetery in Hamburg is the inscription which he had selected, "My life was happy from the beginning to the end." One is reminded of poor Hazlitt's last recorded words—"Well, I have had a happy life"—as he lay dying in poverty at the age of fifty-two, in Frith Street, Soho. His life had been spent in literary and political struggles, embittered by domestic upheavals. As De Quincey wrote, his "mind was always in agitation from the gloomier passions."

Mönckeberg's last paper on medial sclerosis was published the year before he died. Here are the two references, *Virchow's Arch.*, 1903, 171, 141, and *Klin. Wschr.*, 1924, 3, 1473 and 1521.

Some pathologists include mesaortitis, endarteritis obliterans and periarteritis as varieties of arteriosclerosis. Arterial xanthomatosis

may affect the coronary arteries and cause angina. If you look at this patient's arms you will see the brachial arteries are thickened, tortuous and locomotor, being displaced with each systole. Now Dr. K., we will come back to you. What else did you find?

A. The blood pressure is 145/70 mm. Hg. The liver is palpable about 2 in. below the costal margin. The surface is smooth and the edge is sharp.

Q. Is it enlarged or displaced downwards?

A. It is enlarged, because the upper border is found on percussion to be at the normal level in the 5th right intercostal space. I could not feel the spleen or the kidneys. There is no ascites. The abdominal wall is lax and there has been much loss of elasticity in the skin and loss of subcutaneous tissue. The knee-jerks and ankle-jerks are present and the plantar responses are flexor. I could not see the fundi. The feet are cold and rather blue. I could not feel any pulsation in the dorsalis pedis arteries.

Q. What about the posterior tibial arteries?

A. I did not feel for them.

Q. Look at the feet carefully. There is no need to feel for arterial pulsation. You can see a vigorous pulsation in both the dorsalis pedis and the posterior tibial arteries on each side. What about the gangrene?

A. There is none now. The terminal phalanx of the left index toe has been removed.

Q. Did you examine the testicles?

A. No.

Q. Did you examine the prostate?

A. No.

Q. So you have no notion whether the frequency of micturition is due to an enlarged prostate?

A. No.

Q. Did you test the urine?

A. No. I should like to.

Q. There is nothing to prevent you. A specimen is available. We will ask the clerk what he has found.

The clerk looks up his notes and reads: "There is no protein and no reducing substance."

Q. I believe this means no albumin and no sugar. Is there anything else you would like to know?

A. The results of a rectal examination.

Q. The genito-urinary surgeon finds a benign enlargement of the prostate, with probably a large intravesical projection. He considers prostatectomy will probably be required later. At present there is no difficulty or delay in micturition, and the patient says the stream is

always good, "like a tap." A catheter specimen of the urine grew coliform organisms and the streptococcus faecalis, but no casts were found. What do you think, Dr. K., is the matter with the patient?

A. His age and weakness and loss of weight suggest a neoplasm.

Q. Where do you think it may be?

A. It is somewhere hidden. There might be a small primary bronchial carcinoma, or a renal tumour, or a carcinoma of the stomach.

Q. We have decided there is no enlargement of the kidneys, and we have had an intravenous pyelogram. This showed no abnormality in the kidneys or ureters, but the dye shows a filling defect in the base of the bladder which is probably due to a large intravesical projection of the prostate. There is also a diverticulum of the bladder on the right side posteriorly. Here is an X-ray of the chest. There is no evidence of a bronchial carcinoma. The trachea is central. There is a costo-phrenic adhesion on the right side, indicating old pleurisy. The lung fields appear normal. Look at the film, Dr. P., and see if you find anything abnormal.

A. The anterior end of the third left rib is bifid.

Q. That is so, and the radiologist has remarked on a small shadow in the seventh right rib, which he says is a "bone island." What is a bone island?

A. I do not know.

Q. It is an area of cortical bone situated in cancellous bone or in bone marrow. On section it shows the Haversian system of cortical bone. What do you want done now?

A. A barium meal and barium enema.

Q. Here are the films. The barium meal report is as follows: "The œsophagus is normal in the erect and Trendelenberg positions. In the erect position the fundus of the stomach is ptosed, but returns in the prone film to its normal position. There is no abnormality seen in the stomach or duodenum." The barium enema shows diverticula in the sigmoid and an area of local spasm in the upper sigmoid. There is no evidence of growth. The fractional test meal is also normal. Sigmoidoscopy has also been done, and this was normal. What do you want now?

A. I should like to know what the blood count is.

Q. On admission the count was as follows: Red cells 2·8 millions per c.mm., Hb. 33 per cent, C.I. 0·6, White cells 14,000 per c.mm., polymorphs. 83 per cent, lymphocytes 14 per cent, monocytes 2 per cent, eosinophils 1 per cent. There was a severe anæmia of the microcytic hypochromic type. The bone marrow showed a generalized hyperplasia affecting all types of cells. No abnormal cells were seen. What conditions give rise to this type of anæmia?

A. Chronic hæmorrhage.

Q. Yes. It also occurs in infestation with hookworms, the Plummer-Vinson syndrome, and simple achlorhydric anæmia. Is there anything else you would like done?

A. The blood phosphatases, to see if they show any evidence of bone disease or of carcinoma of the prostate.

Q. The acid phosphatase is normal, 2.6 King-Armstrong units per 100 c.c., and the alkaline phosphatase is also normal, 4.3 King-Armstrong units per 100 c.c. Why do we specify King-Armstrong units? Dr. F., you come from Canada, what do you say?

A. The phosphatases are sometimes estimated in Bodansky units. Three King-Armstrong units are approximately equivalent to one Bodansky unit.

Q. The enthusiastic house physician has had certain other investi-

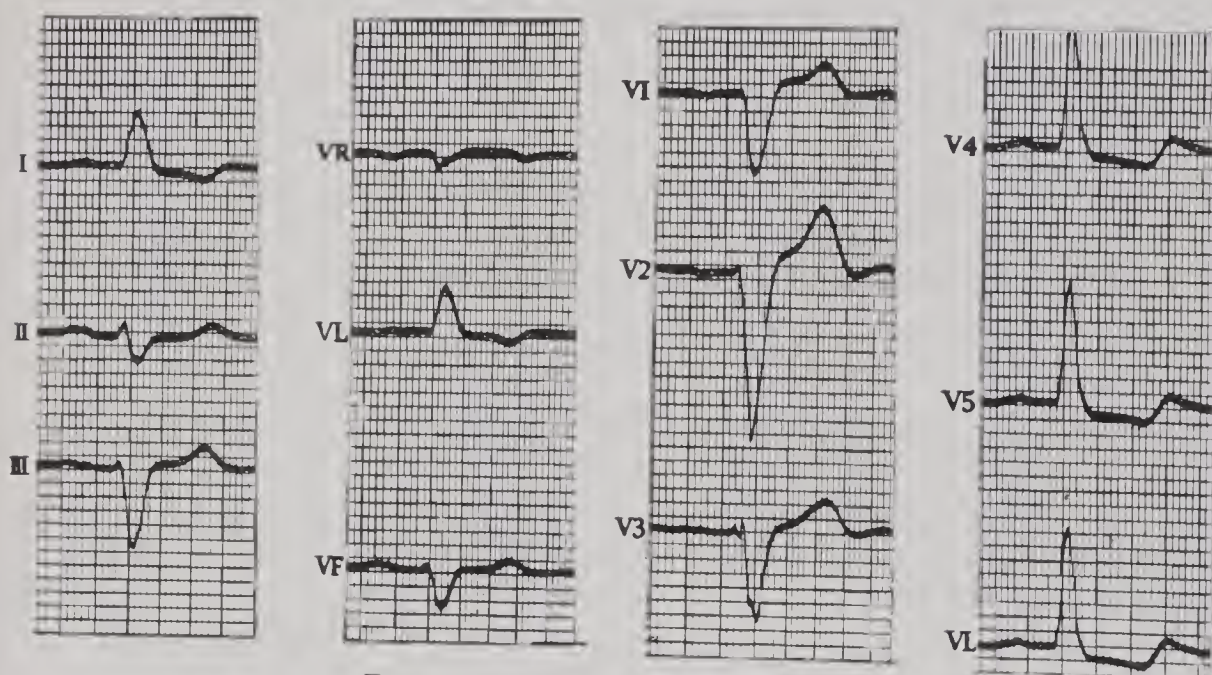


FIG. 52. Left bundle-branch block.

gations done, perhaps with the hope that something would turn up to lighten our darkness, perhaps to give the laboratories some additional work. The blood urea is normal, 30 mg./100 c.c. The alkali reserve is normal, 23 mEq/L. The plasma proteins are normal, total protein 6.6 G., albumin 4.7 G., globulin 1.9 G. per cent. Here is the electrocardiogram (see Fig. 52). What do you think of it Dr. K.?

A. It shows widening of the QRS complexes, the main initial deflection is positive in Lead I and negative in Lead III. T_1 is inverted. This is left bundle-branch block.

Q. The patient has been very carefully examined clinically, and many investigations have been carried out, but we are still unable to arrive at a diagnosis. To revert once more to our friend Sir William Gull, you may or may not remember that he was wont to say, "Acquaint yourselves with the causes which have led up to the disease," and not

infrequently he found the key to the solution of a problem in some circumstance or detail which had attracted but little attention. I should like to ask the patient a few questions now about what happened when he had the fainting attack in the "toilet." Now Mr. S., will you tell me what happened to you in this faint. What happened before you went to the "toilet"?

A. I felt very weak and faint and had to ask my wife to help me to the lavatory.

Q. And what then?

A. As I did not come out my wife came to see what had happened. When she opened the door I fell down. She brought a cushion and put it under my head. I lay there for about a quarter of an hour and then my wife helped me to bed.

Q. Did you pass blood in your motion?

A. No.

Q. Are you sure?

A. Yes.

Q. Did you see the colour of your motion?

A. Yes, it was *black*.

A murmur of "Ah" arises from the class.

Q. Are you sure it was black.

A. Yes.

Q. Had you been taking any medicine?

A. No.

Q. What happened then?

A. I went to bed and did not have my bowels opened again for two days. I then had some paraffin and when my bowels were opened the motions were a dark colour. About two weeks later I felt faint and again passed a large black motion.

Q. It seems quite evident that the collapse in the "toilet" was due to a severe intestinal hæmorrhage. It must have come from high up in the intestine and the most likely source is the duodenum. The two attacks of melæna would probably account for the anæmia. The loss of weight may be associated with the heart lesion and the arteriosclerosis, or he may not have been eating well, although he says that he has taken his usual amount of food. He may have had a symptomless duodenal ulcer, which had healed by the time the barium meal examination was carried out. Another possible explanation is that he has a hæmangiomatic condition of the small intestine. I remember the case we had in this ward, the symptoms being recurrent melæna and anæmia. The condition is not often diagnosed, even at laparotomy, but it should always be borne in mind. Telangiectases are found in the serous coat of the affected portion of the intestine, which may be resected to effect a cure, but there is no time to go into this now.

We are proposing to treat the patient by giving first a blood transfusion, and then administering iron by mouth and a high calorie diet. Care must be taken, however, not to overload the circulation by transfusion owing to the cardiac weakness, as this might result in œdema of the lungs.

* * * * *

The patient left hospital six weeks later having gained over a stone in weight, and with a hæmoglobin percentage of 90.

A CASE OF LUMBAR PAIN

THE patient in No. 10 bed is a single woman, aged thirty, a children's nurse, who was sent to me by her doctor three weeks ago. She was complaining of pain in the right hip and groin for six weeks. The pain was constant, but was relieved by aspirin for a few hours. She had been in bed for four weeks, and during this time her temperature was usually raised to about 99° to 102° F. in the evening. The doctor had referred her to the out-patient department of a hospital devoted to the study of urology. A "straight" X-ray of the abdomen was taken which showed nothing abnormal, and the surgeon considered that the pain was due to a rheumatic nodule in the back pressing on a nerve. The doctor was not satisfied with this diagnosis, as it did not account for the temperature. Further, he had examined a catheter specimen of the urine four weeks previously, which he said was "purulent." The pain was also in the renal area, in the root zones Th.11, 12 and L.1, beginning at the back below the last right rib and extending downwards and forwards towards the right groin. The rheumatic nodule was in the L.2 root area.

Three years previously a black "wart" had been removed from the right side of the patient's neck, as it was beginning to bleed.

I examined the patient and found her general condition fair. She is an Irish girl with red hair. Her weight (clothed) was 7 st. 7 lbs., her highest known weight being 9 st. (clothed) two years ago. The heart was normal, pulse regular, 80, blood pressure 130/80 mm. Hg. The pupils and knee-jerks reacted normally, the fundi were normal. The urine was slightly turbid, neither albumin nor sugar was present and the reaction was pH6, according to the test paper. The pH range of normal urine is 5 to 8. A small, tender "fibrositic" nodule was present just above the crest of the ilium on the right side. I say fibrositic, but these nodules are thought to be due to fatty herniations through the fascial planes between muscles. Some dilated venules were present around the upper thoracic spines, suggesting the possibility of enlargement of the root glands of the lungs. Screen examination of the chest showed the diaphragm movements equal, 1 in. I took a film of the chest. Here it is (see Fig. 53). There is a shadow in the right cardiophrenic region which appears to be formed by two partially superimposed shadows, the upper about 1 in. in diameter, the lower about $2\frac{1}{2} \times 1\frac{3}{4}$ in., a stalk-like shadow extending down to the right diaphragm. There is a linear shadow running up from the upper part of the mediastinum to the right apex, which may be due to the superior vena cava, or to a collapsed upper lobe, probably the former. The patient was

admitted to hospital here ten days ago and she has been running a low grade temperature of about 99° to 101° F. ever since.

Now Dr. B., what do you think is the matter with her?

A. She may have melanotic deposits.

Q. What do you mean? In the lung and in the kidney?

A. Yes.

Q. I think you are quite right to think of this, as she had the



FIG. 53. X-ray of chest showing shadows in right cardio-phrenic region.

“melanotic wart” removed from her neck three years ago. The urine has been tested and it shows no melanin. There are no melanotic spots in the skin or in the eye. What else do you suggest?

A. Abacterial pyuria?

Q. What do you mean by this?

A. Pus in the urine with no bacteria.

Q. What is the cause of it?

A. I do not know.

Q. Well, it might occur in renal tuberculosis, but there is no history of hæmaturia. What else could it be?

A. Hydatid disease.

Q. Where?

A. In the lung and possibly in the liver.

Q. What is the pain due to then?

A. Liver involvement.

Q. And the two rounded shadows we see at the base of the right lung would be two baby hydatid cysts?

A. Yes.

Q. Have you any other suggestions?

A. She may have a primary malignant growth in the kidney, with secondary deposits in the lung.

Q. What sort of a growth?

A. Probably a hypernephroma.

Q. If the patient had been admitted to hospital under your care what investigations would you have had carried out to establish the diagnosis?

A. A full blood count and blood culture.

Q. Why a blood culture?

A. She may have septicæmia.

Q. Is this another possible diagnosis? There does not appear to be anything in the history to suggest it. If the renal pain was associated with septicæmia, she would probably have a focal nephritis with hæmaturia.

To the H.P. What is the blood count?

A. Hb. 80 per cent, Mean corpuscular hæmoglobin concentration 30 per cent, hypochromia, White cells 12,300 per c.mm., polymorphs. 72 per cent, lymphocytes 21 per cent, monocytes 7 per cent.

Q. There is a mild hypochromic iron deficiency anæmia, and a slight leucocytosis. No eosinophils are present and this is against a diagnosis of hydatid. What else do you want, Dr. B.?

A. A Mantoux test.

Q. This has not been done. If it were negative it would be against a diagnosis of renal or pulmonary tuberculosis. What else do you want?

A. The sedimentation rate.

Q. I expect this has been done. Who is the clerk?

A. I am, Sir.

Q. Well, what is the sedimentation rate?

A. 70.

Q. Is that 70 mm. Westergren at one hour?

A. Yes, Sir.

Q. The sedimentation rate is higher than we should expect with a low grade fever. What would you want done now, Dr. B.?

A. A bronchoscopy.

Q. Oh no! Certainly not now, and probably not at all. I think we can diagnose the condition without a bronchoscopy. What else do you want?

A. The kidney function tests.

Q. Why? Do you expect them to show anything abnormal even if one kidney is affected, if the other kidney is working normally?

A. Probably not.

Q. Here are the reports. The urine has a Sp. Gr. of 1.012 in the early morning specimen. It is clear. There is no albumin. The deposit contains no pus cells and no casts, and it is sterile. No tubercle bacilli have been found in the direct film, but a specimen has been injected into a guinea-pig. The blood urea is normal, 35 mg./100 c.c. What else do you want?

A. An examination of the sputum.

Q. She has none. What else?

A. An X-ray of the bones to see if there are any secondary deposits.

Q. We have not done this as it does not appear necessary yet. She has had no symptoms referred to her bones, and no pain in the joints. The last case of hypernephroma we had, presented with acute pain in the upper end of the left femur. No pulsating swelling can be felt in the long bones, as sometimes occurs in hypernephroma. The blood count does not suggest involvement of the bone marrow by secondary deposits, as the anæmia is hypochromic and not leucoerythroblastic. What do you think of the case now?

A. I think she probably has pulmonary and renal tuberculosis.

Q. There is one point which would support this view which we have not emphasized, and that is that she comes from Ireland. What other tests do you want?

After much hesitation.

A. A laryngeal or a throat swab.

Q. What for?

A. To see if tubercle bacilli can be found there.

Q. We will ask someone else now and give you a rest. What is your name?

A. Willis.

Q. What are you doing?

A. I am one of Dr. B——d's clerks.

Q. What do you know about Dr. Thomas Willis? I have asked this before.

A. He was a physician in the 17th century, and he described the circle of Willis at the base of the brain.

Q. The celebrated antiquarian and historian, Anthony À. Wood, in his *Athenae Oxonienses*, gives a life of Willis, who, he says, was the most famous physician of his time. He was born in 1621 and died in 1675. He was an Oxford man and a supporter of King Charles I in the Civil War. Later he practised in London, was physician to Charles II and was buried in Westminster Abbey. Wood says that he became so noted and so infinitely resorted to, for his practice, that never any physician before went beyond him, or got more money yearly than he. This was in the days when a doctor could keep what he earned. Amongst other things he was the first to comment on the sweet taste of the urine in diabetes. What capsule did he describe?

A. Something in the brain.

Q. No. What was the capsule? What about the liver?

A. *Loud shouts from the class.* That was Glisson. He described the capsule of the liver.

I feel discomfited, Homer has nodded again. I try to get out of an awkward situation by saying, "I do not think that Willis described a capsule."

Q. Now Dr. W., what investigations would you like done, and why?

A. An intravenous pyelogram to see if the right kidney appears normal.

Q. Yes, we asked for that, and here are the films. Preliminary film, nothing seen, not even the renal outline. Five minutes film (see Fig. 54), the left renal pelvis and calices are well outlined and the left ureter is shown. No dye is seen on the right side. Ten minutes film, the left ureter is well outlined; some dye is seen in the pelvis, to the right of the mid-line, probably in the bladder. Fifteen minutes film, the left ureter and bladder are well seen. Nothing is seen on the right side. Thirty minutes film, the bladder is evenly filled. There is no dye on the right side. The radiologist reports that there is no X-ray evidence of the right kidney, and, if it has not been removed by nephrectomy, it may be congenitally absent, or it may be aberrantly situated in the pelvis. We know the right kidney has not been removed. Well, Dr. W., what do you think now?

A. I do not think that the pain is renal in origin. It may be referred from the diaphragm or from the spine, or the pain may be pleural in origin, or muscular in the wall of the abdomen. If I had examined the patient I should have examined the spine very carefully.

Q. I did examine the spine. There is very good movement of the spine in all directions. It is very supple and it is not tender. There is no clinical evidence of spinal disease. If you had been given the

opportunity of examining the patient you would have found, as I did, that the right kidney is palpable, and it appears a little enlarged. We can therefore exclude the radiologist's suggestion that the right kidney



FIG. 54. Intravenous pyelogram at five minutes. No dye seen on right side.

is perhaps congenitally absent or situated in the pelvis. What do you think now?

A. The excretion on the right side may be suppressed by a neoplasm or by infection.

Q. What would you do now?

A. Air studies to exclude a renal tumour.

Q. What do you mean? Perirenal insufflation of air?

A. Yes.

Q. This is sometimes useful in suspected suprarenal tumours, such as a phaeochromocytoma, but we have not done it here. Dr. S., what would you do?

A. A retrograde pyelogram, but there is only one way really of establishing the diagnosis, and that is by operation.

Q. Can anyone else suggest anything.

A. *Mr. T. says:* Do an aortogram.

Q. What does an aortogram show in hypernephroma?



FIG. 55. Retrograde pyelogram, showing right ureter filled to pelvi-ureteric junction, and two round shadows of dye, ? indicating hydronephrosis.

A. *Miss B. says:* A very vascular mass.

Q. In hypernephroma the aortogram will show typically irregularity of the arteries in the affected part of the kidney, with pooling of the dye in the arteries. After the dye has been excreted from the healthy part of the kidney it will remain pooled for a time in the affected vessels. It may also show an irregular renal shadow, due to the tumour. The patient was given a general anæsthetic and a retrograde pyelogram and an aortogram were done. The retrograde pyelogram shows the right ureter filled up to the pelvi-ureteric junction, where it is cut off



FIG. 56. Aortogram, showing normal renal arteries.



FIG. 57. Aortogram, showing right kidney larger than left.

by a stricture. Some of the dye was, however, forced beyond the stricture and two round shadows can be seen in the kidney, which probably indicate some degree of hydronephrosis (see Fig. 55). The aortogram shows normal renal arteries in right and left kidneys (see Fig. 56) and the right kidney shadow is larger than the left (see Fig. 57). The diagnosis therefore appears almost certainly to lie between tuberculosis of the kidney, which prevents the excretion of dye in the intravenous pyelogram, or a neoplasm, and in view of all the features of the



FIG. 58. Tomogram of base of right lung, showing cottage-loaf shadow at right base with a stalk running into the shadow of diaphragm.

case it is probably renal tuberculosis. We can now go back to the X-ray film of the chest and see if we can get any further help there. Is there any other examination you would like of the chest?

A. Tomograms of the shadows at the right base.

Q. Yes. These have been done and the shadows show best in cut 10 cm. Here it is (see Fig. 58). The radiologist suggests four possible diagnoses. What do you think they are, Dr. B.?

A. A neoplasm or a tuberculous lesion.

Q. What tuberculous lesion gives rise to solid isolated circular shadows?

A. A tuberculoma.

Q. What else might the shadows be, Dr. S.?

A. A lipoma attached by a stalk to the diaphragm.

Q. The radiologist did not suggest this, but he did mention the possibility of a sequestration cyst and of one other condition. What do you think it was?

A. It might be a hamartoma.

Q. Yes. A hamartoma is a tumour composed of cells derived from the various embryonic layers. It differs from a teratoma which is thought to be formed by division of a totipotent cell. What may a hamartoma in the lung contain?

A. A tooth.

Q. No. It only contains structures normally found in the organ in which it arises. Where is the hamartoma of lung usually situated?

A. In the periphery rather than at the root.

Q. The hamartoma is usually solitary, and it may be composed of cartilage, fibromyxomatous connective tissue, epithelial cells, smooth muscle, fibrous tissue and fat. The cartilage is often impregnated with calcium, when it gives a dense X-ray shadow, resembling that of a chondroma. A microscopical examination of the calcified hamartoma, however, shows clefts lined with epithelial cells. In other cases the tumour looks like a fibroma or lipoma. It is usually impossible to differentiate radiologically between a hamartoma, tuberculoma or carcinoma, if the hamartoma is not calcified. What does the word hamartoma mean? Does no one know? It is derived from the Greek word *ἁμαρτανω*, which means I fail, or I fail to do my duty. Albrecht used this word to indicate that the tissue cells of the organ failed to develop normally, and so the hamartoma is a "failure tumour." In some cases blood vessels dilate to fill the space where the normal tissue cells should develop, and an angioma results.

Dr. Y., you are working at Brompton, what do you know about a tuberculoma?

A. It gives a dense rounded shadow in an X-ray film, and it may be the only evidence of tuberculosis in the lung radiologically. Sometimes its centre caseates and it may then communicate with a bronchus and give rise to bronchogenic spread of the disease in the lung. Some believe that the tuberculoma forms as a result of a blood-borne infection with tubercle bacilli, others that it is the pulmonary component of a primary tuberculous complex.

Q. That is good. The hamartoma is said to be the second most common benign tumour, the most common being the bronchial adenoma. And now tell us what you know about pulmonary sequestration cysts.

A. A sequestration cyst is a rare tumour in which an abnormal branch arises from the aorta, usually near the diaphragm, and supplies

a broncho-pulmonary mass which is dissociated or sequestered from the normally connected bronchial tree.

Q. That is right. The broncho-pulmonary mass may be composed of solid tissue, which gives an opaque shadow radiologically, or it may contain one or more cysts, or it may be bronchiectatic. Clinically it only gives rise to symptoms if the cyst or bronchiectasis is infected, and the diagnosis is usually only made at operation for its removal, when it is found that it is supplied by an abnormal branch from the aorta. In our case, if the shadow is due to a sequestration of lung, no cyst or bronchiectasis is shown on tomography. The appearance of a pedicle leading down to the diaphragm may be a point in favour of sequestration.

Now Dr. B., what would you advise doing?

A. Excise the kidney.

Q. The genito-urinary surgeon has advised us to give the patient a course of streptomycin and I.N.A.H. for two weeks, when he will repeat the retrograde pyelogram. If the condition is tuberculous the stricture at the pelvi-ureteric junction may be relieved and the dye flow more easily into the kidney. She is having this treatment now. Later on I hope to let you know what the correct diagnosis is. There are certain points which we should consider very carefully. 1. The nature of the shadow at the base of the right lung is uncertain. If it is a tuberculoma it would favour a diagnosis of renal tuberculosis. In my experience at Brompton for over thirty years I have very rarely seen renal tuberculosis as a complication of pulmonary tuberculosis. Renal tuberculosis is usually secondary to infection seated in a caseating gland. 2. The aortogram indicates that the substance of the kidney is not involved by a pathological process sufficiently to disturb the normal pattern of the intrarenal arteries. 3. The only definite renal lesion we have established at present is the pelvi-ureteric stricture, with some degree of hydronephrosis.

* * * * *

The repeat retrograde pyelogram was carried out two weeks later. The catheter could not be passed further than the pelvi-ureteric junction, and no dye could be forced beyond the stricture at this point. The genito-urinary surgeon advised nephrectomy after a further course of streptomycin and I.N.A.H.

* * * * *

Nephrectomy was performed a few weeks later. The right kidney was found to be the seat of a carcinomatous growth, situated in the pelvis and involving the ureter (see Fig. 59). The growth is shown as a white mass, the ureter is almost completely obstructed at the pelvi-



FIG. 59. Right kidney, showing white mass of carcinoma in pelvis, and hydronephrosis.

ureteric junction, and there is some degree of hydronephrosis. Microscopical examination showed the carcinoma was of a highly malignant type.

X-ray examination of the chest now showed the shadows at the right base had increased in size, suggesting that they were due to secondary carcinoma of the lung.

* * * * *

After leaving the surgical ward the patient was sent for deep X-ray treatment of the lungs, but secondary nodules of malignant growth were found in the skin, and so all further treatment was abandoned. And this is the end of the sad story of the young woman with primary renal carcinoma.

A CASE OF CEREBRAL FAILURE

THE patient I am going to ask you to examine this afternoon was brought to me by his doctor about four weeks ago as a suspected case of cerebral tumour. He is a married man, sixty years of age, employed as a manager in a showroom in an establishment in the West End of London, not far from here. When I saw him the chief symptoms were headache, numbness of the right upper arm, slowness of speech, slowness of movement, and tiredness.

I will ask my house physician, Dr. J., to read out his account of the history of the patient's present complaint. When he takes so much care in investigating the history it is only right that you should hear it!

Dr. J. reads: "About two months ago the patient went to a football ground in London to watch his favourite team, and, when climbing some steps, put his left foot up on a step but somehow the right leg 'did not follow,' and he fell flat on his back. Afterwards there was no weakness of the leg and he was able to walk away. A month later he felt vaguely ill and went home early from work. The next morning he was quite normal, but after being up for about fifteen minutes he had a sudden onset of right-sided headache, and pain in the right arm, right side of the body and right leg, together with numbness all over the right half of the body. He said that he felt as if he had been 'split in two.' His right arm and right leg went quite limp, in addition to the pain and numbness. He stayed in bed for about a week, during which time these symptoms gradually abated, leaving him with a generalized continuous headache of mild intensity, somewhat worse anteriorly than posteriorly, and with a residual patch of numbness of the right upper arm, from the shoulder to the elbow.

"Since his week in bed he has not been back to work. He has, however, been getting up and sitting in the garden. The headache and numbness are still present, though the former has been much milder for the past two weeks. He has also developed slowness of speech which gradually improves as he goes on talking, and he also finds it rather difficult to remember things. He is not able to concentrate for long and he cannot be bothered reading."

Q. Thank you, Dr. J. What about the past history?

A. Dr. J. reads: "Seven years ago he had an operation for bilateral hernia. Five years ago he coughed up a little blood for nine days. An X-ray film of the chest was taken, which showed no abnormality. Six months later he coughed up blood for three days. He was taken into hospital for investigations, and he says that nothing abnormal was found. Since then he has had no more hæmoptyses."

Q. The family history is sometimes of value as certain diseases tend to run in families, such as diabetes mellitus, high blood pressure and arteriosclerosis. What about his family history, Dr. J.?

A. *Dr. J. reads:* "His mother died of cerebral hæmorrhage and his father of asthma."

Q. Now, Dr. C., would you like to examine the patient and tell us what you think is the matter. The history is very suggestive of the diagnosis, as you doubtless have appreciated.

* * * * *

Q. You have had half an hour. Have you finished?

A. Yes.

Q. Well, what have you found?

A. The patient is a tall man, I should say he is over 6 ft. in height and he weighs 11 st. (stripped), according to the chart. He does not look well. His speech is slow and he pauses while he is talking and looks vaguely round the ward. There is a thick fur on his tongue. He has several carious teeth. The apex of the heart is in the fifth left space, 4 in. from the mid-line. The aortic second sound is accentuated. There are no murmurs. The brachial arteries are thickened and tortuous and the outlines of the right brachial artery can be clearly seen in the middle of the upper arm. The blood pressure is high, 250/160 mm. Hg. The pulse is regular, 80. The lungs are normal. The liver is just palpable, but there is no other abnormality in the abdomen.

Q. What about the scars of the hernia operations?

A. They are soundly healed. I felt no enlarged glands.

Q. Is there any enlargement of the thyroid?

A. No.

Q. Have you tested the urine?

A. Yes. There is a trace of albumin but no sugar.

Q. Did you examine the rectum?

A. No.

Q. *To the house physician:* Have you examined the rectum?

A. Yes, Sir. I think it is normal.

Q. Now Dr. C., tell us what you found when you examined the central nervous system.

A. The cranial nerves are normal.

Q. What about the pupils?

A. I think they are normal.

Q. Dr. W., what do you think of the pupils?

A. The right pupil is small and slightly irregular. The left pupil is of medium size. The right pupil reacts very sluggishly to light and accommodation. The left pupil reacts normally.

Q. Did you examine the fundi, Dr. C.?

A. Yes. There is papillœdema in both eyes.

Q. Anything else?

A. I think there is some retinal arteriosclerosis.

Q. Did you see any hæmorrhages or exudates?

A. No.

Q. There are two small hæmorrhages in the left fundus. If you examine the face a little more carefully you will see there is weakness of the muscles of the lower part of the face on the right side, but not of the upper part of the face. What else did you find?

A. The power and tone of the skeletal muscles are normal. There are no sensory changes. The tendon reflexes are normal in the arms and legs; the abdominal reflexes are present, the plantar responses are flexor. There is slight inco-ordination in the finger-nose test on the right side. The gait is normal and there is no Rombergism.

Q. The chief abnormalities then are arteriosclerosis, high blood pressure, a small and sluggish right pupil, bilateral papillœdema, retinal arteriosclerosis, albuminuria, slight weakness affecting the right lower facial muscles, inco-ordination of the right arm, and a general slowing of movement and of cerebral processes. There is also, I noticed, a tendency to accept the wrong name for an object. What do you think is the diagnosis?

A. I think he may have a cerebral tumour in the left hemisphere, in view of the papillœdema and the changes on the right side of the body. The facial weakness is central in origin.

Q. Why central?

A. Because the muscular weakness affects the lower part of the face. The upper part of the face is usually spared in supranuclear lesions owing to a bilateral representation of the cortical centres for the upper part of the face.

Q. There is one other abnormality which you have not mentioned, and that is that he tends to drop things. What are the three classical features of a cerebral tumour?

A. Headache, vomiting and papillœdema.

Q. The headache has been much less the last two weeks and he has not vomited. These three signs are all indicative of raised intracranial pressure. The most common is headache which is said to occur in 80 per cent of cases of cerebral tumour, whereas the three are only present together in about 60 per cent of cases. What is the papillœdema due to?

A. It is probably caused by pressure of the cerebro-spinal fluid in the sheath of the optic nerve. The central vein of the retina thus becomes obstructed as it lies in the optic nerve.

Q. Is papillœdema more likely to be present with some tumours than with others?

A. It depends upon the position of the tumour. Papillœdema is especially frequently met with in cerebellar tumours or in tumours of the fourth ventricle or temporo-sphenoidal lobes.

Q. Now Dr. W. we will return to what you noticed, the difference in size between the two pupils. What do you think is the cause of the right pupil being smaller than the left, irregular and acting sluggishly to light?

A. The most likely cause, I think, is an attack of iritis in the past which has been followed by adhesions.

Q. Possibly, or it might be due to an old injury. Dilatation of the pupil with atropine would show if adhesions are present. What is the name applied to inequality of the pupils.

A. Anisocoria.

Q. And what is the derivation of anisocoria?

A. I think *aniso* means unequal, but I do not know what *coria* is derived from, I suppose it means a pupil.

Q. The correct Greek word is *ἄνισος* meaning unequal. Why is a pupil called a pupil? I am venturing to ask you this simple question, because I did ask an eye specialist and he seemed a little confused in his answer. Dr. W., you are very learned, tell us.

A. The Greeks called it *κόρη* which means a maiden or a doll, because they noticed that if a person looks into another's eye, he sees in the centre of the eye miniature images.

Q. Yes. Some of you may have read "Madame Bovary," Gustave Flaubert's first and probably best novel. If so, you should remember how Dr. Charles Bovary lay in bed in the morning and looked into the eyes of his second wife, Emma. "He could see himself imaged in miniature as far down as his shoulders, the handkerchief which he wore about his head and the unbuttoned neck of his nightshirt, reflected with meticulous accuracy." The word we use, pupil, is derived from the Latin word *pupa* meaning a doll, and, *pupula* a little lass or a puppet. Having cleared this up would you tell us what conditions cause inequality of the pupils.

A. Drugs such as atropine, homatropine, belladonna and cocaine dilate the pupil, eserine and pilocarpine constrict it.

Q. Do all these drugs act in the same way?

A. No. Eserine and pilocarpine stimulate the parasympathetic fibres of the third cranial nerve, and atropine and belladonna paralyse them. Cocaine, when applied locally, stimulates the sympathetic nerve endings in the dilator muscle of the pupil, or else depresses the tone of the circular muscle of the iris.

Q. Adrenaline also dilates the pupil by stimulation of the sympathetic nerve endings. What else causes anisocoria?

A. Paralysis of the cervical sympathetic causes a small pupil. This may be associated with enophthalmos, narrowing of the palpebral fissure and lack of sweating on the same side of the face.

Q. I think we have discussed Horner's syndrome before, the most important causes are thrombosis of the posterior inferior cerebellar artery; a lesion of the cord at the level of C.7 to Th.1, such as a cord tumour, syringomyelia, disseminated sclerosis or a hæmorrhage; cervical pachymeningitis; a cervical rib; an aortic aneurysm; a mediastinal or cervical tumour; apical lung carcinoma; trauma; or following an apicolysis or a thoracoplasty. What other causes are there of unequal pupils?

A. Stimulation of the cervical sympathetic will cause dilatation of the pupil. This may result from pressure on the nerve, before it is paralysed, as by an aneurysm of the transverse arch of the aorta. Unequal pupils may be seen in nerve diseases such as tabes dorsalis, general paralysis of the insane, Friedreich's ataxia, cerebellar ataxia, and cerebral diplegia. In a cerebral hæmorrhage the pupil on the side of the lesion may be dilated.

Q. Yes. There is also the Markus pupil or the Adie syndrome which we have discussed before. The affected pupil is usually larger than the other one. What other eye lesions may cause inequality of the pupils?

A. In acute or chronic glaucoma the pupil is slightly or moderately dilated, and in iritis it is smaller than in the unaffected eye.

Q. How do you explain this difference?

A. I do not know.

Q. What do you say, Dr. M.?

A. In iritis the vessels of the iris are engorged, which results in constriction of the pupils, but in glaucoma the increased intraocular pressure causes an emptying of the vessels of the iris and the pupil dilates.

Q. Ingenious, but probably inaccurate. Can you think of any other causes?

A. Paralysis of the parasympathetic fibres of the third nerve will cause dilatation of the pupil.

Q. And what conditions give rise to parasympathetic paralysis?

A. Lesions of the nucleus of the third cranial nerve. There is usually also some paralysis or paresis of the external ocular muscles supplied by the third nerve.

Q. What else?

A. An aneurysm pressing on the trunk of the third nerve.

Q. There are other causes of anisocoria you should remember:

one is a glass eye, and another is inequality of the pupils for which no cause can be found, and lastly anisocoria may be congenital.

Now Dr. C., as you think this is a case of cerebral tumour, will you tell us what investigations you require to confirm your diagnosis.

A. A lumbar puncture to see if the pressure of the cerebro-spinal fluid is increased, and an examination of the fluid for protein, cells, Lange colloidal gold curve and the Wassermann reaction.

Q. And what else?

A. An electro-encephalogram, and an X-ray of the skull to see if there is any thinning of the vault of the skull, any beaten silver appearance.

Q. Is there anything else you would like while we are about it?

A. I should like a blood Wassermann reaction, a blood count and the sedimentation rate of the red cells.

Q. We will see whether my house physician also thought these investigations should be done. The patient has only been in hospital a week. The temperature has been normal, and the pulse 80 to 90 a minute.

To the house physician: What results have you?

A. The lumbar puncture was done two days after admission. The cerebro-spinal fluid was clear, pressure 160 mm. of C.S.F., and there was a free rise and fall of pressure on coughing and on jugular compression. The laboratory reports are: One lymphocyte per c.mm. Wassermann reaction negative. Protein 200 mg./100 c.c. Globulin in excess (Pandy test). Chloride 655 mg./100 c.c. Glucose 55 mg./100 c.c. Lange 0001221000.

Q. What do you think of this, Dr. C.?

A. There is no evidence of increased intracranial pressure, which is opposed to a diagnosis of a cerebral tumour. The protein content is high and the Lange curve suggests a mild meningitic reaction.

Q. Are the other figures within normal limits?

A. Yes, the chloride and glucose are normal.

Q. *To the house physician:* What else has been done?

A. The electro-encephalogram report is as follows: "The E.E.G. was slightly abnormal. Records from all leads were rather flat and featureless, but on occasions a low voltage alpha rhythm of 9 c/sec. was seen. For the greater period of recording the dominant rhythm consisted of low voltage 18-22 c/sec. waves. No other significant wave forms were seen. There was no evidence of any focal abnormality. The abnormality is a mild, generalized non-specific one."

Q. This is also opposed to a diagnosis of cerebral tumour. What else have you?

A. The X-ray of the skull, Sir, shows no definite abnormality.

Q. And what about the blood count, the blood Wassermann reaction and the sedimentation rate of the red cells?

A. The Hb. is 84 per cent, White cells 6,000 per c.mm., polymorphs. 64 per cent, lymphocytes 24 per cent, monocytes 12 per cent. The blood Wassermann reaction is negative, and the E.S.R. is 12 mm./1 hour (Westergren).

Q. There you are, Dr. C., and what is your diagnosis now?

A. I do not think there is enough evidence to diagnose a cerebral tumour.

Q. But what about the evidence which points to a lesion in the left cerebral hemisphere?

A. It might possibly be a vascular neoplasm in view of the increased protein content of the cerebro-spinal fluid.

Q. How would you proceed to investigate this?

A. I think a left-sided cerebral arteriogram might be helpful.

Q. This has not been done. What else might account for his ill health?

A. The symptoms may be due to cerebral arteriosclerosis and cerebral softening.

Q. Yes. He has a high blood pressure and arteriosclerosis, but, if so, how would you explain the papillœdema? You had better think this over. Have you any other diagnosis to suggest?

A. In view of the arteriosclerosis and albuminuria, he may be suffering from chronic uræmia.

Q. Yes, I think that is a good suggestion and it will have to be followed up. There is one other investigation we have done in the week he has been in hospital, and that is an X-ray film of the chest in view of the history of hæmoptysis. This does not show any abnormality and so the hæmoptysis may have been associated with an increased blood pressure.

In a week or so we will look at the patient again and see what else has been found out.

* * * * *

Since we last saw this patient two weeks ago, on June 2nd, there have been some alarming episodes. On June 3rd, at midnight, he had an attack of vomiting and became very irrational. The blood pressure was 260/155 mm. Hg., pulse 100. An intramuscular injection of mg. 15 hexamethonium bromide was given and in twenty minutes the pressure fell to 210/140 mm. Hg. and the patient was talking more sensibly. A further mg. 10 of hexamethonium bromide was then injected intramuscularly, and the blood pressure fell in a quarter of an hour to 195/125 mm. Hg. with a pulse of 80. Next morning he was very drowsy, very slow in movement, and did not pay much attention

to attempts to rouse him. The blood pressure had risen to 230/130 mm. Hg. He vomited in all 16 oz. during the night. Two days later he was better and said he was feeling well, but the pressure was 240/150 mm. Hg. On June 9th he was sufficiently well to walk round the ward, but a day later he was again very drowsy. The patient was now examined by an eye specialist who considered the retinal changes were due to hypertension. He found papillœdema more on the right than on the left, with spastic arteries, and soft retinal exudates. He could not explain the raised protein content of the cerebro-spinal fluid.

On June 11th the patient was practically unconscious, and he was incontinent. He was given 30 c.c. of 20 per cent saline intravenously with no apparent effect. On June 12th he was still unconscious, with mucus in the trachea—the death rattle. The eye specialist saw him again on June 13th and found papillœdema 1·5D in the right eye and 0·5D in the left eye. He still considered the fundus picture was that of hypertension.

To-day is June 16th and as you see he is lying in bed in a semi-comatose condition; he can only be roused with great difficulty and he does not speak. What do you now think, Dr. C., is the cause of his illness, and his rapid deterioration.

A. He may be suffering from uræmia.

Q. How would you decide whether he is?

A. The urine contains a trace of albumin, it should be examined for casts, and the blood urea should be determined.

Q. *To the house physician:* Have we these results?

A. Yes, Sir. The urine contains a few hyaline and granular casts. The blood urea is 26 mg./100 c.c.

Q. There is probably some renal damage, benign renal arteriosclerosis associated with the essential hypertension, but if he were dying of uræmia the blood urea would be much higher. Now, Dr. W., looking back on the history of the case, and following the course of the illness, what do you think is the most likely diagnosis?

A. Cerebral arteriosclerosis with cerebral softening.

Q. What do you mean by softening?

A. Degenerative changes in the brain secondary to thrombosis or hæmorrhage.

Q. The clinical evidence points to a succession of strokes, the first being a minor one, when he was at the football match on April 3rd last, and another small one on April 21st when he was at work, and a more severe one the next day when he felt "split in two," and probably some more severe ones in hospital when he had the attacks of unconsciousness. The lesions appear to have been chiefly on the left side of the brain. Does anyone know who has recently drawn attention to what he calls "The Little Strokes"?

No answer.

Q. Dr. Walter C. Alvarez, Professor of Medicine of the University of Minnesota has written about them. He said he had ransacked the literature trying to find a good description of the common syndrome in which a man or woman dies over the course of ten or twenty years with a series of little strokes. He could not find what he was looking for anywhere. I have his paper here. He says a man may have two or three little strokes in the fifties and not die until he is over eighty, living as a sort of feeble-minded child for thirty years; or a man or woman dies over the course of twenty years with a series of little strokes.

The pathologist sees evidence of them frequently in the post-mortem room, there are little black spots in the brain, and some larger ones which must have produced during life a dizzy spell, or a transient weakness of some muscles, or a great change in character. Many people peter out with one little stroke after another. Many of the thromboses occur at night, when the blood pressure is lowest. Attacks of vomiting are very frequent with the occurrence of a little stroke, followed for a day or so by a feeling of confusion and loss of balance. Mental deterioration often ensues. This is a little of what Alvarez has written about little strokes—you should always bear them in mind, and I think that this patient is succumbing to a series of strokes, the first two of which were comparatively minor episodes.

* * * * *

When I examined the patient again on June 21st he showed a left hemianopia, possibly homonymous. There was left hemiparesis, flaccid, with bilateral extensor plantar responses. It was not possible to test the sensory side. The clinical picture now suggested a right cerebral hæmorrhage. During the following week the coma gradually deepened and death occurred on July 3rd, five and a half weeks after admission, and three months after the original stroke.

The post-mortem examination showed areas of hæmorrhage and softening in the brain. The surface of the brain was very œdematous. The vessels showed marked atheroma. In the right frontal lobe, in the region of the motor area, there was an area of hæmorrhage and softening 1 in. in diameter, and $\frac{1}{4}$ in. below the surface. In the right parietal region there was a similar area of hæmorrhage and softening, $\frac{1}{3}$ in. in diameter adjoining the surface, and in the left parieto-occipital region there was an area of hæmorrhage and softening $1\frac{3}{4}$ in. in diameter. Section showed central areas of necrotic brain and blood clot surrounded by several punctate hæmorrhages and numerous compound granular corpuscles. The kidneys were congested. The capsule stripped easily leaving a smooth surface. Sections showed well

marked hypertensive changes with fibrinoid degeneration of the arterioles and thickening of the medium sized arteries from elastosis and fibrosis. Several glomeruli showed hyaline fibrosis. The heart weighed 18 oz. It was moderately enlarged due to left ventricular hypertrophy, the coronary arteries showed mild atheroma. The valves and chambers appeared normal.

The previous hæmoptyses were explained by finding bilateral basal bronchiectasis.

A CASE OF BLOOD IN THE URINE

THE patient in No. 1 bed comes from India, but as he speaks little English, scarcely more than "Yes" and "No," we are fortunate in having with us this afternoon Dr. R. from Calcutta, who will help us in extracting the details of the patient's illness.

Q. Dr. B., where do you come from?

A. From Australia—Melbourne.

Q. Where is that? On the East Coast?

A. No. It is in the South.

Q. Will you examine the patient while we look at a few X-ray films.

* * * * *

Q. Now Dr. B. tell us the history you have obtained with Dr. R.'s help.

A. The patient is forty years old. He has been in England a year, working as a kitchen porter in a restaurant; before that he served as a stoker for fifteen years in the British Indian Merchant Service. He had malaria two years ago, and at this time he also had jaundice and passed dark urine. Two years ago he had an operation on his left eye. For the past few months he has noticed lassitude, shortness of breath, palpitations and cramps in the legs. He has suffered no pain. He thinks he has lost a little weight, but he does not know how much.

Q. What does this history suggest?

A. Anæmia.

Q. Amongst other things, such as heart trouble or tuberculosis. What may cause cramps in the legs?

A. Deficient circulation due to arteriosclerosis or arterial obstruction, or anæmia.

Q. What else?

A. They may be a symptom of tetany or of peripheral neuritis.

Q. Are there any other causes?

A. They are said to occur in cholera, and in hot climates due to salt loss by excessive sweating.

Q. They are also sometimes met with in cachetic conditions due to tuberculosis or chronic nephritis. Apart from these causes I have seen some cases in which cramps are relieved by calcium although the blood calcium figure is normal. What was wrong with his eye?

A. He has pterygium in the left eye.

Q. What is this?

A. A simple affection of the conjunctiva, which may grow over the cornea and interfere with vision.

Q. What is the name derived from?

A. I do not know.

Q. Why is the pterygoid bone called pterygoid?

A. It is shaped like a wing.

Q. The Greek word πτέρυξ means a wing. Is pterygium a common condition?

A. Not in England. In England it is usually seen in people much exposed to the weather, such as cab drivers. It is more common in hot, dry and dusty climates.

Q. Do you know anything else about it?

A. It is usually found on the nasal side of the eye. It is probably a degeneration of the conjunctiva, and in the early stages it is red and vascular.

Q. What happens later?

A. It becomes paler and fibrous. It tends to recur after removal.

Q. How *do* you know so much, doctor?

A. I have studied eyes for a diploma!

Q. What else did you find?

A. The patient looks ill, but is not wasted. He appears apathetic. There is no icterus of the conjunctivæ. The buccal mucous membrane is pale, and there are some pigmented patches on it. He has his own teeth and there is some gingivitis.

Q. Did you find any pus between the teeth and gums?

A. No.

Q. Did you press the gums with your fingers and see if you could express any pus?

A. No.

Q. Well, he has been seen by our dental surgeon and he pressed out a considerable amount of pus between the gums and teeth. What is this condition called?

A. Pyorrhœa alveolaris.

Q. Whose disease is this? Who described it?

No answer.

Q. Does no one know? Dr. R., you come from Calcutta. I am sure you know.

A. Rigg's disease.

Q. Yes. That is right. What about the tongue?

A. It is furred.

Q. Is it smooth?

A. No.

Q. Did you notice anything else about the tongue?

A. No.

Q. Dr. P., look at the tongue. What do you see?

A. The tongue is rather pale; it is smooth and the fur has a yellowish tinge.

Q. Yes. What else did you find, Dr. B.?

A. There are no enlarged glands. There is no koilonychia.

Q. What does that suggest?

A. If he is anæmic the anæmia is probably not a simple achlorhydric one with iron deficiency.

Q. What else did you find?

A. The spleen is not enlarged. The liver is palpable two fingers' breadth below the costal margin. The heart is enlarged, the apex is $\frac{3}{4}$ in. outside the mid-clavicular line. There is a soft systolic murmur heard all over the præcordium and conducted towards the mid-axilla.

Q. What is the cause of the murmur?

A. It is probably a hæmic one due to anæmia.

Q. Yes, dilatation of the heart may occur in severe anæmia, without hypertrophy. This is especially likely in children. The hæmic systolic murmur is soft, it is often heard better at the base than at the apex, and it varies with change in position, with breathing and with exercise. Is there a venous hum in the neck—a *bruit de diable*?

A. No.

Q. We have talked about *bruit de diable* before (see "Applied Medicine," p. 120). It is a continuous venous hum heard over the jugular veins in anæmia. Laënnec described it in 1829, but he thought it arose in the arteries. What is the blood pressure?

A. 100/60 mm. Hg.

Q. What else did you find?

A. The percussion note is impaired over the bases of the lungs and there are some crepitations.

Q. What is this due to?

A. There is some œdema of the bases. There is no œdema of the legs. The central nervous system is normal. The tendon reflexes are normal, but I was uncertain about the sensation tests because of the language difficulty.

Q. Did you test the urine?

A. Yes. It contains albumin and blood. There is no bile.

Q. Do you mean bilirubin?

A. Yes.

Q. Did you test for urobilinogen?

A. No.

Q. There is no urobilinogen. Is there much albumin?

A. A trace on boiling.

Q. There was no blood found in the urine on admission, and it

was only first detected after the patient had been in hospital for ten days. It was then found in a specimen passed in the afternoon. How did you test for blood?

A. By the guaiacum test.

Q. What is guaiacum?

A. It is a resin obtained from guaiacum wood.

Q. What is the other name for guaiacum wood?

No answer.

Q. Do you mean to say that you have come all the way from Australia and you don't know the other name for guaiacum wood. It is *lignum vitae*. What does *lignum vitae* mean? Does no one know? The tree, I believe, comes from tropical America and the wood is very hard and durable. Lignum is the Latin for wood.

What do you think is the cause of the blood in the urine? Has he acute nephritis?

A. No. I think a basis of anæmia will explain all the findings.

Q. How do you exclude acute nephritis?

A. There is no œdema and the blood pressure is not raised.

Q. What else would you want to know?

A. The urine should be examined for casts, and, with acute nephritis there would probably be oliguria.

Q. No casts have been found, and he is passing about 40 oz. of urine daily. Do you think the anæmia is due to the blood in the urine?

A. It might be, but I do not think there is any renal tumour.

Q. What investigations would you ask for, if you were my house physician and were trying to establish the diagnosis?

A. First a blood count.

Q. Here it is: Hb. 53 per cent, Red cells 2·8 millions per c.mm., C.I. 0·9, Mean corpuscular hæmoglobin concentration 27 per cent, White cells 2,600 per c.mm., polymorphs. 47 per cent, lymphocytes 32 per cent, monocytes 15 per cent, eosinophils 6 per cent. There is hypochromia, with slight macrocytosis, anisocytosis, poikilocytosis, and polychromasia. Reticulocytes 23·5 per cent. What does this suggest?

A. There is a severe anæmia, with iron deficiency, as the mean corpuscular hæmoglobin concentration is below the normal limits of 32 to 38 per cent.

Q. What does the reticulocytosis indicate?

A. Excessive blood formation in the bone marrow, with immature cells being poured out into the circulation.

Q. Under what conditions does it occur?

A. When a patient with pernicious anæmia is treated with liver or folic acid the reticulocytes increase in number during the early stages of the treatment, if the liver preparation is potent. It occurs

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also with intravenous iron in severe cases of iron deficiency anæmia. It is also found after a severe hæmorrhage, if the tissues respond well. A more or less permanent reticulocytosis may occur in cases of chronic blood destruction, such as congenital or acquired acholuric jaundice, or sickle cell anæmia, if the hæmopoietic function of the marrow is well preserved.

Q. This patient has had no treatment for the anæmia, so the reticulocytosis is not due to treatment. In acholuric jaundice, or hæmolytic icterus as it is often called, some degree of jaundice is usually apparent clinically. Further, spherocytes are usually found in the blood and the fragility of the red cells is increased. In this case the fragility of the red cells is normal, and there are no spherocytes and no sickle cells. It is possible therefore that the reticulocytosis is due to the loss of blood in the urine. This would be particularly likely to occur if the loss of blood were intermittent. The cause of the loss of blood in the urine seems to be obscure. What other investigations do you want?

A. An X-ray of the kidney.

Q. Why? Do you think he has a stone? There is nothing in the history to suggest this. What further examination, Dr. R., do you want done on the urine?

A. A microscopical examination to see if the condition is one of hæmaturia?

Q. What else might it be?

A. Hæmoglobinuria.

Q. It is a case of hæmoglobinuria. The urine showed the presence of methæmoglobin. Dr. R., as the patient comes from India, what do you think is the most likely cause of the hæmoglobinuria?

A. Blackwater fever.

Q. If you look at the temperature chart you will see there is no fever, and an examination of the blood shows no malarial parasites.

Dr. R. replies: Malarial parasites are not always found in blackwater fever.

Q. What sort of anæmia do you think is present here, Dr. B.?

A. A hæmolytic anæmia.

Q. By a hæmolytic anæmia you mean an anæmia caused by increased blood destruction. How many red cells are normally destroyed every second?

A. I think about 10 millions.

Q. In many acute hæmolytic anæmias the anæmia is due not only to hæmolysins, but the toxic agent may interfere with the normal formation of red cells in the bone marrow. There are several other factors which may be at work in hæmolytic anæmias. The spleen may cause excessive destruction of the red cells, the red cells may be

clumped by isoagglutinins, which cause them to be destroyed by the normal buffeting processes, and the hæmolysins may so affect the red cells that they are acted on by complement. When the hæmolysis occurs very rapidly the hæmoglobin cannot be converted into bilirubin and hæmoglobinuria results without obvious jaundice. Further, if the hæmoglobin in the plasma rises to about 40 mg./100 c.c. the hæmoglobin is decomposed into hæmatin and globin. The hæmatin then combines with the plasma albumin and forms methæmalbumin. Methæmalbumin is not excreted by the kidney owing to the size of its molecule, and is dealt with by the liver and excreted in the fæces as coproporphyrin III. What is coproporphyrin III?

A. Coproporphyrin is porphyrin found in fæces. I do not know what the III is.

Q. What is porphyrin?

A. There are several pigments called porphyrins which occur in plants and animals. Coproporphyrin is chiefly derived from foods, but some of it is formed in the intestines from bilirubin.

Q. And what about the III?

No answer.

Q. Well, as you know, or as you do not know, the porphyrins contain four pyrrole nuclei linked in a ring. Coproporphyrin Type I and Type III are isomers depending on the position in the ring of the $\text{CH}_2\text{CH}_2\text{COOH}$ radicles. What laboratory tests indicate increased blood destruction?

A. An excess of urobilinogen in the fæces.

Q. What is the normal amount of urobilinogen in the fæces? Mr. S., you have just passed your physiology examination, what do you say?

A. Up to 300 mg. in the twenty-four hours.

Q. Yes. That is approximately correct, and with increased blood destruction the figure may rise to 2,000 mg. in twenty-four hours. An increase of bilirubin in the blood and of urobilinogen in the urine may only indicate hepatic inefficiency and not increased blood destruction. What other changes occur in the blood, Dr. B., with acute hæmolysis?

A. Hæmoglobinæmia and methæmalbuminæmia.

Q. How can methæmalbumin be detected in the blood?

A. Spectroscopically.

Q. If it is present in the plasma in large amounts it can be detected by direct spectroscopy. If it is present in small amounts Schumm's test is used. The serum is covered with ether, and then one-tenth the volume of concentrated ammonium sulphide and a few drops of ammonia are added. After shaking, an absorption band is seen in the yellow-green zone of the spectrum. The plasma has been examined

in this case and methæmalbumin is present. Now we know that the patient has an acute hæmolytic anæmia with hæmoglobinuria, we should be able to establish the diagnosis fairly easily by a process of exclusion. What are the causes of hæmoglobinuria, Dr. B.?

A. Chemical substances such as quinine, arsine and certain sulphonamides, particularly sulphanilamide, Sulphapyridine and Sulphadiazine.

Q. Hæmoglobinuria has also been recorded after the intravenous injection of Myanesin, during anæsthesia, to relax muscle spasm. What is another cause?

A. A mismatched blood transfusion.

Q. And what else?

A. Allergy to broad beans, which is known as Fabism.

Q. The bean is the *vicia faba*. The hæmoglobinuria may result from inhaling the pollen or from eating the beans. It is met with in Sicily, Sardinia and Southern Italy. It has also been described in America. And what is the next big group?

A. Blackwater fever.

Q. This is an important cause, but what else is there?

A. The paroxysmal hæmoglobinurias.

Q. How are they subdivided?

A. The cold hæmoglobinurias. The hæmoglobinuria occurs when the patient is exposed to cold, and the patient is usually suffering from congenital syphilis.

Q. An attack may be induced by immersing the feet in ice-cold water for ten minutes. Whose test is this? Does no one know? It is the Rosenbach test.

To H.P. Has this test been done?

A. No Sir.

Q. What other test is there? It seems to be better known.

A. The Donáth-Landsteiner reaction.

Q. What is this?

A. It is an *in vitro* test. The serum or plasma contains a lysin which unites with the red cells only when the blood is cooled. The autohæmolysin acts as an amboceptor, and, on warming the blood, complement unites with the red-cell-amboceptor complex, and the red cells are hæmolysed. The test is performed in a test tube.

Q. Some cases of cold hæmoglobinuria have been recorded in which there is no evidence of syphilis and the Donáth-Landsteiner reaction is negative, but the Rosenbach test is positive. The red cells appear to show an increased susceptibility to mechanical trauma produced by centrifugalization with glass beads. What is another cause of hæmoglobinuria?

A. Exercise.

Q. Yes, in some people physical exertion, or standing in a position of lordosis, results in hæmoglobinuria. It occurs almost entirely in males between the ages of ten and twenty years. It is perhaps analogous to postural albuminuria, it is benign and the patient grows out of it. Dr. W., give us another cause of hæmoglobinuria.

A. The pigment in the urine may be myohæmoglobin, derived from the muscles, as in the crush syndrome which was met with in air-raided casualties.

Q. Are there any other varieties of myoglobinuria?

A. There is paroxysmal myoglobinuria or paralytic myoglobinuria.

Q. What do you know about this?

A. Paralytic myoglobinuria occurs in horses, especially when

FIG. 60.—The Frisches Haff.



they are taken out for exercise after resting. The horse passes dark urine containing myoglobin, and there is weakness or paralysis of the hind legs. It has also been recorded in man, and at autopsy the muscles are white like "fish flesh."

Q. A condition known as *Haffkrankheit* was described in 1932, occurring in East Prussia, in Königsberg. It is characterized by muscular weakness and myohæmoglobinuria. It was thought to be due to eating fish, especially eels, poisoned by certain cellulose trade effluents containing pine tree resin, poured out from the two cellulose factories into a water inlet of the Baltic. The German word "*Haff*" means a gulf or inlet sea, and "*Krankheit*" is, of course, illness or disease. Königsberg is situated on the river Pregel. It is about five miles from Frisches Haff into which the Pregel discharges its water. The Haff is formed by a long and very narrow strip or tongue of land, running parallel to the coast, and between it and the sea. It is joined

to land at one end and open to the sea by a narrow inlet at the other end. This peculiar strip of land is called *Nehrung* and it is thirty miles long (see Fig. 60). The water in Frisches Haff is probably brackish.

Later, an outbreak occurred in Sweden, and this was considered to be due to eating fish which contained some substance inactivating vitamin B₁. It is therefore possible that intravenous injections of vitamin B₁ might cure the condition, which bears a resemblance to the Chastek paralysis occurring in silver foxes fed on certain raw fish, which is cured by injection of vitamin B₁.

We can exclude all these causes of hæmoglobinuria in this case, except possibly the variety of cold hæmoglobinuria in which there is no evidence of syphilis and in which the Donáth-Landsteiner test is negative. What do you suggest as a possible cause here, Dr. B.?

A. It may be a case of Lederer's anæmia.

Q. You talk very glibly of Lederer's anæmia. Who is Lederer and when did he describe his anæmia?

A. I am afraid I do not know.

Q. Max Lederer of Brooklyn, New York. I have his paper here. The reference is *Journ. Amer. Med. Sci.*, 1925, **170**, 500. It is entitled "A form of acute hæmolytic anæmia probably of infective origin." Three cases are described, characterized by a sudden onset, with fever, leucocytosis and severe anæmia. The blood picture resembles that of pernicious anæmia. Lederer thought the behaviour of the disease suggested an infection with a selective action on the reticulo-endothelial system. A rapid cure was effected in each case by a single blood transfusion. When the pathologist reported on the blood in our case he suggested Lederer's anæmia as a possible diagnosis, but there are certain objections. What are they?

A. There is no fever in this case.

Q. And what else?

A. In Lederer's anæmia there is usually a leucocytosis of 20,000 to 40,000 per c.mm., with some myelocytes or myeloblasts. Here there is leucopenia. Nucleated red cells are often present in the blood in Lederer's anæmia, but they are not found here.

Q. It is now thought that Lederer's anæmia is due to the presence of a hæmolysin, and the blood has to be very carefully matched, including a Coombs test before the transfusion is given. Dr. M., you are a hæmatologist. What do you know about the Coombs test?

A. It was introduced by Coombs, in association with Mourant and Race in 1925. They carried out the research work in Cambridge, in connection with hæmolytic disease of the newborn and Rh incompatibility. The test was devised to detect "incomplete" Rh antibody, which differs from true Rh agglutinin as it fails to agglutinate the red cells which it sensitizes, but yet it is an important cause of disease.

By this test, red cells which are sensitized by weak agglutinin or "incomplete" antibody, can be made to agglutinate strongly. Coombs started with the idea that sensitized red cells have adsorbed antibody globulin at some points on their surface, and that an anti-human-globulin serum would react with this and cause agglutination.

Q. Tell us some more about the test. There is, I believe, a direct and indirect test.

A. Yes. The direct test is used for demonstrating the antibody globulin adsorbed to the red cells, the indirect test for showing the presence of "incomplete" antibodies in the serum.

Q. What is the direct Coombs test?

A. The patient's red cells are washed three times in saline to remove any trace of plasma proteins, and they are then mixed on a slide with the Coombs reagent. If any antibody globulin is adsorbed on the red cells agglutination will occur, and the test is positive.

Q. What is the Coombs reagent?

A. It is rabbit anti-human-globulin, and is prepared by immunizing a rabbit with serum from a group O person, or with purified globulins.

Q. What happens then if the direct test is positive?

A. The patient's red cells, which have on their surface adsorbed antibody globulin, agglutinate, because they become connected together by the antibody in the rabbit's serum. Hæmolysis usually follows agglutination as a secondary effect.

Q. When is the direct Coombs test positive?

A. In acquired acholuric jaundice, or as it is now called, idiopathic hæmolytic anæmia, the direct Coombs test is positive, indicating that the abnormality lies in the red cells and not in the serum. The direct Coombs test is also positive in hæmolytic disease of the newborn, mismatched blood transfusions, in hæmolytic anæmia due to cold hæmagglutinins in virus pneumonia, in cold hæmoglobinuria, and in symptomatic hæmolytic anæmia occurring in conditions such as Hodgkin's disease, leukæmia and cirrhosis of the liver. The direct Coombs test is negative in congenital acholuric jaundice which is also known as congenital hæmolytic anæmia.

Q. What is the indirect Coombs test?

A. The patient's serum to be tested is incubated with normal red cells of known group at 37° C. for one hour. The cells are then washed three times and mixed with the Coombs reagent, as in the direct test. If the normal red cells have been sensitized by adsorption of antibodies in the patient's serum, agglutination occurs on mixing with the Coombs reagent, as they become connected by the antibody in the rabbit's serum.

Q. What is the indirect test used for?

A. For detecting "incomplete" Rh antibody, and for detecting in hæmolytic anæmia the presence of antibody in the serum.

Q. Thank you very much, Dr. M., I hope you all understand it. What else causes acute hæmolytic anæmia with hæmoglobinuria?

A. Paroxysmal nocturnal hæmoglobinuria.

Q. What is another name for it?

A. The Marchiafava-Micheli syndrome.

Q. Marchiafava and Micheli's descriptions in Italy date back to 1911 and 1931, but Paul Strübing in Germany gave an excellent account of it in 1882 which has been largely overlooked. Gull in 1866 described a case in the Guy's Hospital Reports, which he thought was due to cold. He called it a case of intermittent hæmatinuria, but it showed clearly the picture of nocturnal hæmoglobinuria. If you are interested in the subject you should look up the historical review by W. H. Crosby published in *Blood*, 1951, 6, 270. Strübing was far in advance of his times, and he suggested that the nocturnal occurrence was due to the accumulation of CO₂ and the sluggish circulation during the night, a view which was ignored for fifty years. The disease is somewhat rare. The last example I had was a woman, a patient in this hospital. My house physician, J. Marks, was sufficiently interested to write subsequently a review of the condition in the *Quarterly Journal of Medicine*. The reference is 1949, N.S.18, 105. He collected 76 cases in the literature. Crosby quoted 123 cases up to January 1950. What are the characteristic features?

A. The periodical passage by night of dark urine containing hæmoglobin. The urine passed by day is either free from hæmoglobin or contains it in much smaller amounts. There is also anæmia with leucopenia. The urine contains hæmosiderin granules, either intermittently or perpetually.

Q. To H.P. Has the urine in this case been tested for hæmosiderin?

A. Yes, Sir. It contains hæmosiderin.

Q. When this patient was first admitted to hospital there was no blood in the urine, as I said before, and the only obvious abnormality was the anæmia. The presence of a hæmolytic anæmia with leucopenia should have suggested the diagnosis of nocturnal hæmoglobinuria. When the blood was first found in the urine it was in an afternoon specimen, and it was not until a few days later that the nocturnal rhythm was appreciated. What do you know about paroxysmal nocturnal hæmoglobinuria clinically, Dr. B.?

A. It most commonly affects people between the ages of twenty and thirty years. Crises may occur with increased anæmia, much hæmoglobinuria, and pain in the back or abdomen. There may be

slight jaundice. The anæmia is usually constantly present, the hæmoglobinuria being intermittent.

Q. To H.P. What is the blood bilirubin figure in this case?

A. 1.8 mg./100 c.c.

Q. This is only slightly raised above the normal maximum of 0.8 mg./100 c.c. Do you know anything about the cause of the disease?

A. It is now thought to be due to an abnormality of the patient's red cells, so that they become sensitive to small amounts of hæmolysin normally present in serum.

Q. Some work has been done on the structural constitution of the hæmoglobin in the red cells by electrophoretic studies, and it has been shown that whereas in sickle cell anæmia the hæmoglobin is structurally abnormal, it is normal in nocturnal hæmoglobinuria. There appears to be some change on the surface of the red cells which renders them unduly sensitive to small amounts of hæmolysin. The Coombs test is negative in this case indicating there is no antibody globulin or hæmolysin adsorbed on the red cells, and the defect probably lies in the envelope of the cells. Further, if normal red cells are transfused into the patient they survive for a normal time. If the patient's red cells are transfused into a normal person a number of them are rapidly destroyed.

We said just now that Strübing suggested that the nocturnal occurrence of the hæmoglobinuria was due to the blood becoming acid during sleep. What do you know about this?

A. There is the acid serum test of Ham, which shows that *in vitro* the patient's red cells are unduly sensitive to hæmolysins in acidified serum.

Q. To H.P. What is the result of the test here?

A. It is positive, Sir.

Q. Is there any objection to this test?

No answer.

Q. McIlvaine and Beard in 1951 found that the venous blood pH was generally more alkaline during sleep, and they believe the nocturnal hæmolytic process is not due to increased acidity *per se*. They published this paper in *Blood*, 1951, 6, 936.

We found the pH of the venous blood was 7.1 at 1 a.m., and 7.1 at 6 p.m., so there was no evidence of increased acidity during the night. The normal pH of venous blood is said to be about 7.3. There was therefore no increased acidity of the patient's blood found by night, although the blood was slightly less alkaline than normal.

There is another test which is used in this disease, the heat test of Heglin and Maier. Five c.c. of the patient's blood are put in a clean dry tube under paraffin and allowed to clot in an incubator at 37° C. In the Marchiafava-Micheli syndrome over 500 mg. of hæmoglobin

per 100 c.c. of blood are hæmolysed in six hours. Normal red cells show little, if any, hæmolysis. In other hæmolytic diseases the hæmolysis is usually below 50 mg./100 c.c. We have done this test and you can see the tube containing the patient's blood and a control with normal blood. In the patient's blood there is a broad zone of hæmolysis above the red cells, and the reading is 540 mg. of hæmolysed hæmoglobin per 100 c.c. The control shows hardly any hæmolysis. There seems little doubt therefore that this is a case of nocturnal hæmoglobinuria. What treatment would you recommend?

A. Alkalis have been given.

Q. In some cases after a temporary improvement the condition appears to be worse. All forms of treatment are very unsatisfactory, including alkalis, prostigmine and pilocarpine, and there is a grave risk of thrombosis occurring in varying parts of the body. Temporary improvement may follow intravenous injection of saline-washed red cells, on the assumption that there is some substance in the plasma which causes hæmolysis. Death is likely to occur within a few years of the diagnosis being made, either from anæmia, infection, or thrombosis of the portal vessels or of those supplying the central nervous system.

A CASE OF RECURRENT ABDOMINAL PAIN

THE patient in bed 7 is a single woman, twenty-two years of age, who works as a machinist of men's clothes. She was admitted to hospital here, about three weeks ago, on account of an attack of severe abdominal pain, seven weeks before admission, with slight recurrences since then. The pain came on in the middle of the day, while she was at work, and gradually became worse. She called in her general practitioner after she had been vomiting for two days. She told him she had been constipated for three days and the abdominal pain was still present. The doctor found no localizing signs in the abdomen, and the pulse and temperature were normal. The urine was dark, but no abnormal constituents were found in it. Next day her condition was much the same, the pulse was 80, temperature normal, there was slight tenderness in the right iliac fossa, and some pain in the right knee. The doctor considered two possible diagnoses, subacute appendicitis or right obturator hernia. Pain now developed in the left thigh and knee, which appeared to rule out the diagnosis of right obturator hernia, and the patient was admitted to a hospital near her home, where a normal appendix was removed.

The abdominal pain was not noticed for a few days after the operation, but it has recurred periodically since. It is intermittent, often lasting only a few minutes and resembling the pain of intestinal colic. The patient usually knows when the pain is coming on, as it is preceded by waterbrash, a salty-tasting saliva filling the mouth a few minutes before the onset of the pain. The pain is widely distributed over the abdomen, and does not radiate to the back or groins. She has never had anything like this before, and she was not taking any drugs before the pain began. Her periods are regular and not painful. There has been no disturbance of micturition. The only previous illness she knows of is chicken-pox at the age of three.

Well, Dr. R., that is the history, will you examine the patient now and let me know what you find.

Dr. R. examines the patient while we look on, apparently disinterestedly.

Q. What have you found?

A. The patient does not look ill. She is sitting up in bed. She is mentally alert and answers questions readily. There is acne on the face and shoulders. She is rather thin and looks as if she has lost weight recently. There is no cyanosis.

Q. How much does she weigh?

A. I do not know.

Q. The weight on the temperature chart, which I noticed you looked at, is 6 st. 2 lb. Three years ago she weighed 8 st. 10 lb. She thinks that she has lost a good deal of weight during the last four weeks. What else did you find?

A. The mucous membranes appear slightly anæmic, and she is rather pale. The teeth are bad, many of them are decayed, and some have broken off near the gum. The tongue is slightly furred. There are no enlarged glands. The heart is not enlarged and there are no murmurs. The pulse is 110, regular. The blood pressure is 120/70 mm. Hg. The chest is normal and there is no clubbing of the fingers.

Q. And what about the abdomen?

A. There is a recent appendix operation scar, which appears soundly healed. The abdominal movement is good, there is no tenderness, no rigidity and I can feel nothing abnormal.

Q. Does she still complain of abdominal pain?

A. I have not asked her.

Q. Have you still abdominal pain, Miss V.?

A. Yes, a little vague discomfort all over my stomach. I had an attack of pain again yesterday, but it was not nearly so bad as the first one.

Q. Well, Dr. R., is that all your examination?

A. Yes.

Q. Have you examined the urine?

A. No.

Q. Have you seen a specimen?

A. No.

Q. Is there a specimen available, Sister?

A. Yes, Sir.

Q. The clerk has tested it. He has written in his notes that it contains no albumin, no blood and no sugar. What do you think is the matter with the patient?

A. I think she has had an attack of intestinal colic.

Q. Did you examine the legs?

A. No.

Q. What about the nervous system?

A. The cranial nerves are normal.

Q. Look at the legs.

Dr. R. examines the legs, tests the knee-jerks and ankle-jerks and says they are normal.

Q. Is there any evidence of peripheral neuritis?

A. No. She has no pain in the legs, there is no tenderness in the muscles and no muscular weakness.

Q. You did not test for sensory changes, I noticed. Well, then,

do you think this is just a case of intestinal colic, cause unknown, cure none?

A. It might be due to intestinal allergy.

Q. Yes, that is a good suggestion. I remember seeing a nurse here who had several attacks of acute pain in the right iliac fossa. I was asked to see her as a surgeon wanted to remove her appendix. She had an attack of pain when I was asked to examine her and I noticed that her face was swollen, around and especially under the eyes. She told me that she had noticed the swelling of her face in previous attacks, and this, of course, at once gave the clue to the diagnosis of angio-neurotic œdema and saved her from an unnecessary operation. There has been no history of angio-neurotic œdema, however, in this case. After your somewhat incomplete examination you said you found no evidence of neuritis, but you probably remember that she had symptoms suggesting neuritis in both legs during the first acute attack. Does that suggest anything?

A. She might have lead colic.

Q. I suppose that is possible, but there is no history of exposure to lead at her work. If you think she may have lead poisoning what tests do you want done?

A. An examination of the blood to see if there is any punctate basophilia.

Q. Here is the blood count:—Red cells 4·5 millions per c.mm., Hb. 90 per cent, C.I. 1·0, White cells 5,500 per c.cm., polymorphs. 51 per cent, lymphocytes 43 per cent, monocytes 6 per cent. The red cells are normal in size and shape and there is no punctate basophilia. What further examination would you want if you still suspect lead poisoning?

A. Examination of the urine for lead.

Q. How much lead must be present in the urine to be diagnostic of poisoning or of excess excretion?

A. I am afraid I don't know.

Q. The figure usually accepted is more than 0·3 mg. lead per litre of urine. We have talked about the diagnosis of lead poisoning before, about the blue line on the gums and who described it, so we will not go into that again (see "Applied Medicine," p. 457).

Q. What other examination do you want, if you suspect attacks of intestinal colic?

A. A barium meal and a barium enema.

Q. A barium meal has been done and it is normal. It was not thought necessary to do a barium enema. What do you think now?

A. I think she may have attacks of spasm of the colon, and if a barium enema had been done it might have shown a spastic colon.

Q. How would you treat her then?

A. I should prescribe some antispasmodic drugs.

Q. What would you choose?

A. I should try her first with a mixture containing gr. 5 of sodium bromide, m. $7\frac{1}{2}$ to 10 of tincture of belladonna and gr. 15 of sodium bicarbonate, to be taken three times a day before meals.

Q. And if this does not work what other antispasmodic could you use?

A. Belladenal tablets.

Q. What are they?

A. They are put up by Sandoz I think, and contain Bellafoline and phenobarbitone.

Q. Yes. Each tablet contains mg. 0.25 Bellafoline and mg. 50 phenobarbitone. What is supposed to be the advantage of Bellafoline over atropine?

A. They are both obtained from fresh belladonna leaves, but Bellafoline is more potent being free from the inactive dextrorotatory isomers.

Q. This sounds very learned, you must be a chemical physician; you will be talking about milli-equivalents next. Are there any other antispasmodics?

A. I have seen Banthine used in hospitals and Pro-Banthine.

Q. What is Banthine?

A. I do not know.

Q. It is described as methantheline bromide. Pro-Banthine is said to have a similar anticholinergic action, to be more potent and to have less marked or no side effects. What is the dose?

A. Banthine is put up in mg. 50 and Pro-Banthine in mg. 15 tablets. One or two are taken three or four times a day before food.

Q. We did not have the barium enema done because we have diagnosed the cause of the trouble without it. Have you any other suggestions or do you want any other investigations done as a shot in the dark. I hope not—you should only ask for an investigation for a definite purpose.

A. As her teeth appear so bad I think she should have dental treatment and the teeth should be X-rayed first.

Q. Are you suggesting the attacks of abdominal pain are due to bad teeth?

A. No, but they may be interfering with her general health.

Q. *To H.P.* Have the teeth been X-rayed?

A. Yes, Sir. Here are the films and the report:—"There is an abscess at the apex of $\underline{3}$ /. A portion of the roots of $\underline{7}$ / remains near the alveolar margin. There is a pulp stone in the pulp cavity of $\underline{7}$, and there may be a pulp stone in $\underline{8}$."

Q. Well, Dr. R., there is some dental sepsis which should be treated. What is a pulp stone?

A. I do not know.

Q. Neither do I, perhaps someone does.

A. Dr. S. says that a pulp stone is a round or cylindrical opacity in the pulp chamber or root canal. It is most often seen in elderly people.

Q. You must have read a radiology book, or are you a dentist? What do you think is the cause of her abdominal pain, Dr. R.? I am sorry to appear to be so persistent, but we must solve the problem. There was one word in the history I read to you which provides the clue. Just one little word. What was it?

A. I have no idea.

Q. Well, I will ask someone else. What would you do, Dr. P.?

A. I should like to see the urine and to have it examined microscopically.

Q. Why?

A. She may have attacks of renal colic and the urine may contain blood or oxalate crystals.

Q. Yes. That is a good suggestion, I have seen three patients, two women and one man, with recurrent attacks of abdominal pain, usually with flatulent distension of the colon, which have been mistaken for colitis, but which were associated with oxaluria. How do you explain the connections between the oxaluria and the colonic symptoms?

A. It has been suggested that the colonic symptoms are due to fermentation of carbohydrates in the large intestine. Normally starch is digested before it reaches the cæcum. It is said that this may lead to oxaluria, but I do not know why.

Q. Neither do I. Here is the urine. What do you notice on naked eye examination?

A. It is dark.

Q. Yes. That is the key word. When I read out the history I read, "The urine was dark, but no abnormal constituents were found in it." The dark colour was therefore presumably not due to blood or to bile. What may cause dark urine?

A. The commonest cause is concentration due to sweating or to diminished fluid intake. It is also noticed that after a hot bath at night the urine passed first thing in the morning is more concentrated than usual.

Q. The colour of the urine was described as that of port wine by my house physician. What does port wine coloured urine suggest to you?

A. The patient may have been taking some drug, such as sulphonal, which causes porphyria.

Q. I told you in the history that she denied taking any drugs. Sulphonal is very rarely used now, but there are other drugs which may cause porphyria. At any rate we should consider porphyria further. What else may cause the urine to be dark brown or reddish, besides blood, bile, hot baths and porphyrins?

A. I believe some people pass red urine after eating beetroot.

Q. Yes. That is so and if the urine is acid it is red after taking Pyridium. Dr. P., what do you now suggest is the diagnosis in this case?

A. I think probably the patient is subject to attacks of idiopathic porphyrinuria or as it is usually called, porphyria.

Q. The urine has been examined several times for porphyrins and they have been found. As you know the urine in porphyria may be of normal colour when passed and darken to a brown or red shade on standing. The pigment can be detected spectroscopically. The precursor of porphobilin is porphobilinogen. It can be distinguished from urobilinogen chemically by the Watson and Schwartz test. You can see the test here. In one tube is the patient's urine, in the other is urine from another patient which contains urobilinogen. When Ehrlich's reagent, para-dimethyl-aminobenzaldehyde, is added to each, a red colour is produced. You will find various descriptions of how the test is done in different books, but here is the original paper (*Proc. Soc. Exp. Biol. and Med.*, 1941, **47**, 393). "Equal parts of urine and Ehrlich's reagent are mixed in a test tube. To this mixture is then added an equal volume of a saturated aqueous solution of sodium acetate. A few c.c. of chloroform are then added and the solutions are thoroughly mixed. The aldehyde component of porphobilinogen remains in the aqueous fraction, while that of urobilinogen is completely extracted by the chloroform." (See Fig. 61.)

Here is one of the laboratory reports. "Porphobilinogen is present in considerable quantities. This material was converted to uroporphyrin for analysis. Uroporphyrin, 1.41 mg. in twenty-four hours (normal nil to a trace). Coproporphyrin 0.91 mg. in twenty-four hours (normal 10 to 100 micrograms).

Some other tests have been done. The urine contains no casts. The Van Slyke renal function test is 53 per cent of normal, so this is below the normal low level of about 70 per cent. The blood chemistry for urea, uric acid, chlorides, cholesterol, sodium and potassium are all normal. In some cases the blood sodium and chloride have been found to be below normal, suggesting renal failure. The excretion of 17-ketosteroids in the urine is 6.0 mg. in twenty-four hours, which is normal. The fat in faeces is normal.

Now we have arrived at the diagnosis of acute idiopathic porphyria. I should like to tell you that the diagnosis was made by the general

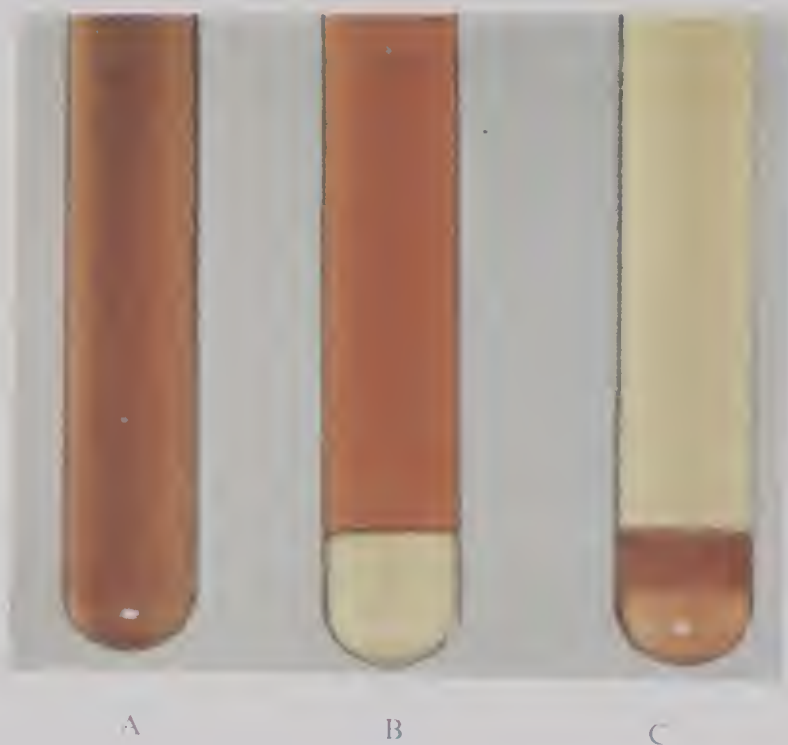


FIG. 61. Ehrlich's test for porphobilinogen and urobilinogen.

Tube A
Patient's urine containing porphobilinogen.

Tube B
Patient's urine after addition of Ehrlich's aldehyde reagent and CHCl_3 . Porphobilinogen not extracted in CHCl_3 layer.

Tube C
Urine containing excess of urobilinogen after addition of Ehrlich's aldehyde reagent and CHCl_3 . Urobilinogen extracted in CHCl_3 layer.

practitioner who sent the patient to me. All credit to him, an old Middlesex man and one of my former clerks. He suggested the possibility of porphyria after the laparotomy revealed nothing abnormal in the abdomen, but this suggestion was received with scorn. However, the house physician arranged for the urine to be examined, when porphyrins were found.

Dr. K. now intervenes to say that he remembers seeing a case in Sydney in which the patient, a woman, was admitted to hospital on account of peripheral neuritis. The physician noticed a pink spot on the sheet when he was examining her, which suggested to him the diagnosis of porphyrinuria which proved to be correct. The pink spot was a stain from a drop of urine.

Now Dr. P., tell me something more about porphyria and porphyrins. What does the word porphyria mean?

A. Purple. I think it comes from a Greek word.

Q. What is porphyrite?

A. A hard red rock.

Q. It was quarried in ancient times in Egypt. There is a very attractive road on the French Riviera between Cannes and St. Raphael where the coast is lined with masses of red porphyrite. Dr. M., you come from India. Is it true that palaces are built of porphyrite in your country?

A. I have never seen any.

Q. As Macaulay would say, "Every schoolboy knows," or should know, what Macaulay wrote in his essay on Warren Hastings, when he described how Hastings was trying to extract money for the East India Company from the Maharajah Numcomar and the unfortunate Bengalese. He wrote, "The most absurd notions were entertained in England respecting the wealth of India. Palaces of porphyry, hung with the richest brocade, heaps of pearls and diamonds, vaults from which pagodas and gold mohurs were measured out by the bushel, filled the imagination even of men of business." What is a mohur, Dr. M.?

A. A gold coin worth 15 rupees.

Q. The pagoda was also an Indian coin. There is also the well-known phrase "born in the purple" which referred originally to one born of the Imperial family at Constantinople, in the chamber called Porphyra. It was afterwards used to signify a child born after his father's accession to the throne. And then there is Browning's poem "Porphyria's Lover." I do not know what this has to do with purple. Porphyria had yellow hair which her lover wound affectionately round her neck,

"and all her hair
In one long yellow string I wound

Three times her little throat around,
And strangled her."

What is a porphyrin?

A. It is a pigment.

Q. Yes. Where does it occur?

A. It is found in animals and plants. Magnesium porphyrin is present in chlorophyll. Porphyrins are also found in the brown pigment of egg shells and in the dark line running down the back of the earthworm. They are also present in the feathers of the Turaco, or plantain eater, a South African bird, and a copper derivative, hæmocyanin, occurs in crustacea.

Q. What is coproporphyrin?

A. It is a pigment formed in the intestine from bilirubin.

Q. And what about hæmatoporphyrin.

A. It does not occur naturally, but is found by treating hæmoglobin or hæmin with strong acids.

Q. Chemically it is closely related to protoporphyrin. The porphyrins contain four pyrrole nuclei which are linked in a ring. When they are linked in a chain they provide bile pigments. Here is a diagram of pyrrole nucleus (see Fig. 62).

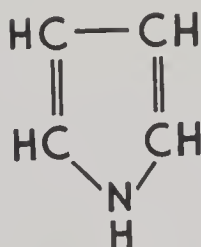


FIG. 62. Pyrrole nucleus.

There are four possible isomers, but only two are known in nature, the I and III, such as uroporphyrin I and uroporphyrin III. The uroporphyrins contain eight COOH groups and the coproporphyrins four COOH groups. If porphyrins are injected into animals they cause them to be highly sensitive to light. Skin lesions form and the animal may die. This is of clinical importance in one variety of porphyria which occurs in man. Normally uroporphyrin occurs in traces in the urine. It is derived from vegetable and animal substances in food, and not from a breakdown of hæmoglobin. What do you mean by the disease porphyria?

A. It is a term which is used to describe certain conditions in man which result from a disorder of porphyrin metabolism. Some authorities consider that it is a reversal to a primitive type of pigment metabolism, others that it is due to an overproduction of porphyrin at a certain stage in the synthesis of hæmoglobin. Some of the red cells in these patients may also have a shorter span of life than normal.

Q. What is the normal life-span of an erythrocyte?

A. 120-130 days.

Q. What are the clinical types of porphyria?

A. It may be congenital, as in *hydropoia aestivale seu vacciniforme*.

Q. Yes. This was first described by Günther in 1911. If you want it, the reference is Günther, H. (1911), *Deutsch. Arch. klin. Med.*, **105**, 89. A. E. Garrod later gave an account of it in the second edition of his book, "Inborn Errors of Metabolism," published in 1923, which you have all probably read or should have read. It is a familial disease. Garrod was the first to describe pinkish-red milk teeth, almost indistinguishable in colour from the gums. They are not always present. Various skin lesions form on exposure to light. There may also be ectropion. The disease may cause horrible disfigurement and blindness, owing to the scarring and loss of subcutaneous tissues which follow the skin and conjunctival lesions. The bones are often a deep brown colour due to deposition of uroporphyrin. The urine is usually of port wine colour when it is passed, and contains uroporphyrin I and coproporphyrin I. The faeces contain coproporphyrin I. In Garrod's patient the mother said that the very first urine passed by the child was red. What other varieties are there?

A. The toxic or induced porphyria which results from taking certain drugs, especially Trional, sulphonal, Veronal, phenobarbitone, the sulphonamides, and arsenic preparations.

Q. Yes. It may also result from lead, phosphorus and possibly alcohol. What is another variety?

A. Some people have described a symptomatic variety occurring in anæmias and certain infections.

Q. There has been a paper published recently in the *Brit. Med. Journ.* on "Cutaneous Porphyria" by Discombe and Treip which I have here. The reference is 1953, *ii*, 1134. They say that the skin may respond in three ways, by vesication, pigmentation, or the development of hirsuties. Vesication usually occurs in the spring or summer on areas exposed to light. It is probably a congenital condition, but may not manifest itself until adult life. To what class does our patient belong?

A. The intermittent or acute form.

Q. Yes. It is sometimes called visceral porphyria and was described by Waldenström as acute porphyria. It is better called intermittent acute porphyria, as the tendency to the condition persists between the acute episodes. It is a hereditary disease and usually shows itself about the age of thirty years. What are the three chief clinical features?

A. Attacks of abdominal pain of a colicky nature usually with severe constipation.

Q. It may be mistaken for paralytic ileus, and there are usually nausea and vomiting during the attack, and the blood pressure rises to about 180/120 mm. Hg. What are the other clinical features?

A. Nervous symptoms such as peripheral neuritis, cranial nerve palsies, paræsthesia, bulbar paralysis and sometimes epileptiform convulsions or amaurosis.

Q. And what else?

A. The urinary symptoms. The urine is either reddish-brown when passed, or on standing and on exposure to light the urine turns red.

Q. The uroporphyrin is usually type III, it may contain uroporphyrin I or coproporphyrin III. The uroporphyrin contains zinc. What is the prognosis in the visceral variety?

A. It is not very good, especially if nervous symptoms are present. About 80 per cent of cases die in five years after the onset of nervous signs.

Q. What is found post-mortem?

A. There is a red fluorescence with ultra-violet light of the costal cartilages and of muscles.

Q. How would you treat a case of acute porphyria?

A. I should give a sedative for the pain.

Q. What sedative?

A. Tincture of opium.

Q. Yes—barbiturates must never be given. Calcium gluconate may be injected intravenously for colic in doses of 10–20 c.c. of a 10 per cent solution. A.C.T.H. has been used, without any success.

To H.P. Have you found out whether there is any family history of porphyria in this case?

A. Yes, Sir. Her father suffers from it. It seems likely that an uncle died from it, and on two or three occasions narrowly escaped a laparotomy on account of acute abdominal symptoms.

Q. There is just one other point. The patient's skin showed no abnormal sensitivity to ultra-violet light which is the usual finding in this type of porphyria.

A CASE OF DYSPNŒA

WOULD you like to examine this patient, Dr. R., while we look at some X-ray films? We will come back in about twenty minutes. I want you to find out why he is short of breath.

* * * * *

Q. Well, what have you discovered? Tell us the history briefly.

A. The patient is a married man fifty-four years of age, engaged in the building trade. He has noticed shortness of breath, usually at night, for the last two years, and it has been getting worse for the last six months following an attack of influenza.

Q. What about his previous history?

A. He had pleurisy and pneumonia at the age of four years, followed by an operation on the chest, probably for empyema.

Q. Has he had any other illnesses?

A. No, he has always had good health and played professional football for nine seasons, weighing then about 14 st. 3 lb. When at work he may walk as much as ten miles in a day, including going up and down stairs in various houses.

Q. Does he look well?

A. He is lying comfortably in bed, propped up on pillows. There is no cyanosis and no dyspnœa. He is well nourished. His complexion is sallow.

Q. Quite, but does he look well?

A. Yes.

Q. What is his weight and height.

A. I don't know.

Q. His weight is 14 st. 9½ lb. (clothed) and he is 5 ft. 11 in. tall. Well, now tell us what you have found on examination.

A. His lungs are wheezy.

Q. That is not the best way to describe the examination of the chest, let's have it a little more systematically.

A. He has a big chest, the expansion is only fair.

Q. Did you measure the expansion?

A. No.

Q. Who is the clerk?

A. I am, Sir.

Q. Look up your notes and tell us what is the expansion.

A. It is 2 in. at the nipples, from 35 to 37 in.

Q. Now Dr. R., will you go on.

A. There is no dulness on percussion over the lungs. The breath sounds are vesicular and there are a few rhonchi in each lung.

Q. What do these signs suggest?

A. Chronic bronchitis, with perhaps some emphysema.

Q. I suppose you saw the empyema operation scar on the right side of the chest; you have not mentioned it. What about the heart?

A. I think the heart is enlarged but I cannot feel the apex beat. The heart sounds are distant and there are no murmurs.

Q. Why do you think the heart is enlarged?

A. I can hear the sounds at the apex a little outside the nipple line.

Q. We shall see. And the blood pressure and arteries?

A. The blood pressure is 160/110 mm. Hg. The arteries are not thickened.

Q. I think the brachial and radial arteries are slightly thickened. Is there anything wrong with his heart?

A. He told me that when you examined him before he came into hospital that you said to his doctor——

Q. I think it will spoil the case if you tell the class what I said to his doctor. I am not ashamed of it! I will let you tell them later on. What do you think the shortness of breath is due to?

A. I think that it is partly due to bronchitis and partly due to his heart.

Q. What is wrong with the heart?

A. I think it is a little enlarged and that there is hypertensive heart disease.

Q. My house physician and my registrar both emphatically believe that the attacks of shortness of breath at night are asthmatic, and that asthma is the cause of his nocturnal dyspnoea. I have strongly disagreed with this view, but we will come back to this later. Did you find anything else abnormal?

A. No.

Q. Are the fingers clubbed?

A. No.

Q. You told us he is not cyanosed, but I noticed his lips and ears were a little blue when I saw him before he came in. Is the abdomen normal?

A. Yes.

Q. And the legs?

A. Yes.

Q. Have you examined the urine?

A. No.

Q. You should have. The urine, however, contains no albumin and no sugar. What further examinations do you want now?

A. An X-ray of the chest.

Q. Here it is (see Fig. 63). The heart is not enlarged. There is a right costo-phrenic adhesion probably due to the old empyema. Do you see anything else abnormal?

A. The lung fields are a little emphysematous.

Q. Anything else?

A. No, I can't see anything.



FIG. 63. X-ray of chest in "A Case of Dyspnœa."

Q. What else do you want?

A. An electrocardiogram.

Q. Here it is—what does it show?

A. The heart beat is rapid, but regular. The QRS complexes are wide and notched. T_1 is inverted. It shows bundle-branch block.

Q. Yes, of what they call Type I, as the main initial deflection is upright in Lead I, and inverted in Lead III. Now you all realize what I thought when I examined the patient before he came into hospital. I found a slight degree of bronchitis and emphysema, and bundle-branch block and considered the dyspnœa was due chiefly to the heart,

and not to the lungs. But I did not pay sufficient attention then to one of his symptoms. I thought I had found the answer to the problem when I discovered the bundle-branch block. What other investigation would you like?

A. The circulation time from arm to tongue should help to distinguish between dyspnœa due to the heart, and dyspnœa due to bronchitis and emphysema or bronchial asthma.

Q. We have had this done; injecting 5 c.c. of 20 per cent Decholin into a vein in the right elbow and the patient saying directly he noticed a bitter taste. The arm to tongue circulation time in this case is 15 seconds, which is normal. This does not suggest that the dyspnœa is cardiac. What else would you like?

A. A blood count and a vital capacity.

Q. The blood count is Hb. 111 per cent or 16.2 G. per cent, White cells 11,000 per c.mm., polymorphs. 67 per cent, lymphocytes 23 per cent, monocytes 4 per cent, eosinophils 6 per cent. There is a slight increase in hæmoglobin corresponding with the slight degree of cyanosis. The vital capacity is 2,800 c.c. which is about 57 per cent of the patient's normal. The diminished vital capacity indicates probably some interference with respiration. What do you think now is the cause of the dyspnœa.

A. I think it is mainly cardiac, in view of the hypertension and bundle-branch block.

Q. Against this is the fact that he can walk quite well and go up and down stairs, and the circulation time is normal. He has not much bronchitis and not much emphysema, but the house physician and registrar persisted in thinking the nocturnal dyspnœa to be due to asthma. We can see from the notes, which cannot lie, that the house physician treated him first as a cardiac case, with Cardophylin and digitalis, and then switched over to anti-histamines and anti-asthmatic drugs such as Phenergan, stramonium and iodides, and adrenaline injections, and Neo-Epinine by mouth. The house physician has written in the notes "he is still getting attacks at night of a true asthmatic character," which, as we shall see later, illustrates the danger of being too dogmatic in Medicine. Despite this, I still did not believe the dyspnœa was asthmatic, and if you will go back to the beginning and pay more attention to the history, you will discover the clue to the diagnosis. Now Dr. L. you always help us out of our difficulties—ask the patient to describe his symptoms again.

Dr. L. sits on the bed, and asks the patient to tell him exactly what he has noticed wrong with his breathing.

The patient says, "I get short of breath in attacks at night".

Q. How long have you had it for?

A. For about two years off and on.

Q. Do you get it by day?

A. Yes, sometimes on exerting myself.

Q. What do the attacks feel like?

A. I get a tight sensation in my throat—I feel “choky.”

I interrupt. There—that’s the clue; he feels choking in the attacks. Ask him where he feels the choking.



FIG. 64. Tomogram. Trachea displaced to left by a mass on right of trachea. Smaller mass on right side at level of tracheal bifurcation.

The patient points to the top of the sternum and to the supra-sternal notch.

Q. Now Dr. L., what do you think of it?

A. There is probably some mediastinal pressure, such as a retro-sternal goitre.

Q. Do you think he has a retro-sternal goitre?

Dr. L. examines the patient with his neck extended, feels in the supra-sternal notch while the patient swallows, and percusses the manubrium sterni.

A. I cannot find any evidence of a retro-sternal goitre, but there may be one.

Q. I showed you a patient with a retro-sternal goitre causing asthmatic symptoms who was relieved by operation a few months ago (see Goitrogenous Asthma, p. 144). We have X-rayed this patient and found no evidence of a goitre. What would you do now?



FIG. 65. Right anterior oblique X-ray of chest. Dislocation forward of oesophagus and trachea by right aortic arch.

A. I should like to have tomograms of the mediastinum to see if there is any evidence of deviation or constriction of the trachea.

Q. Good! That is the next step. We have had this done. The trachea is displaced a little to the left behind the sternum, and the X-ray report is as follows: "The 9, 10 and 11 cm. cuts show a mass to the right of the trachea, pushing the trachea across to the left. Another smaller mass is seen on the same side at the level of the tracheal bifurcation. The nature of these two masses is not certain. They are

probably glandular in origin.” Here are the films, you can see the lumen of the trachea is a little narrowed at the site of the upper shadow. (See Fig. 64.)

There are two points in the patient's symptoms which have not yet been elicited, which will have to be explained: 1. He cannot sleep on his right side, and he gets relief from the choking feeling and dyspnœa by lying on the left side. 2. He does not get relief from sitting up and bending forwards, as is the case with an aneurysm. What do you think the mass or masses are, Dr. L.?

A. The mass might be a lymphosarcoma, a thymus, a lipoma, a dermoid, a gumma or due to Hodgkin's disease.

One of the audience asks: Could the shadow be due to a mediastinal empyema, as he had an empyema before, when he was four years old?

To this I reply: Hardly.

Q. This is as far as we have got in the diagnosis. Next week perhaps we shall have solved the problem.

* * * * *

We think we have solved the problem during the week, thanks to the radiologist and the cardiologist. The patient was X-rayed again after the tomograms had shown the shadow displacing the trachea, and it was then seen in the first oblique position, that the circular shadow to the right of the trachea was pulsating (see Fig. 65). The report is as follows: “Barium swallow and screening: The œsophagus is displaced forwards behind the manubrium sterni by a circular opacity, which, on the screen with the œsophagus filled with barium, showed expansile pulsation. The impression of the left aortic knuckle was smaller than normal, and lay just below the impression on the posterior wall of the œsophagus. These findings are in favour of a double aortic arch encircling the trachea and œsophagus, the main vessel being the right-sided arch passing behind the œsophagus and descending on the left, with a smaller left-sided arch joining it. This would account for the appearance of a small left aortic knuckle (see Fig. 63) and an apparent right aortic arch, with left descending aorta.” The blood Wassermann reaction has been done, and it is negative. Will someone tell us a little about the development of the aorta, and the formation of double aortic arches?

A. There are six pairs of arterial arches in the embryo which unite the primitive dorsal and ventral aortas. Some of these disappear, others persist. The first and the second pairs disappear. The third pair form part of the internal carotid arteries. Part of the fourth right arch disappears, and the fourth left arch forms part of the aorta. The fifth arches disappear and the sixth arches form the pulmonary

arteries. In double aortic arch, the left and right fourth arches persist, the left being smaller than the right. The two arches meet posteriorly and fuse with the dorsal aorta. The aorta thus encircles the trachea and œsophagus.

Q. Both aortic arches persist in reptiles. The right is behind the œsophagus and the left in front of the trachea. My registrar has made a plasticine model showing the state of affairs. Here is also a diagram of it taken from Taussig's "Congenital Malformations of the Heart" (see Fig. 66). The heart is usually normal in cases of double aorta.

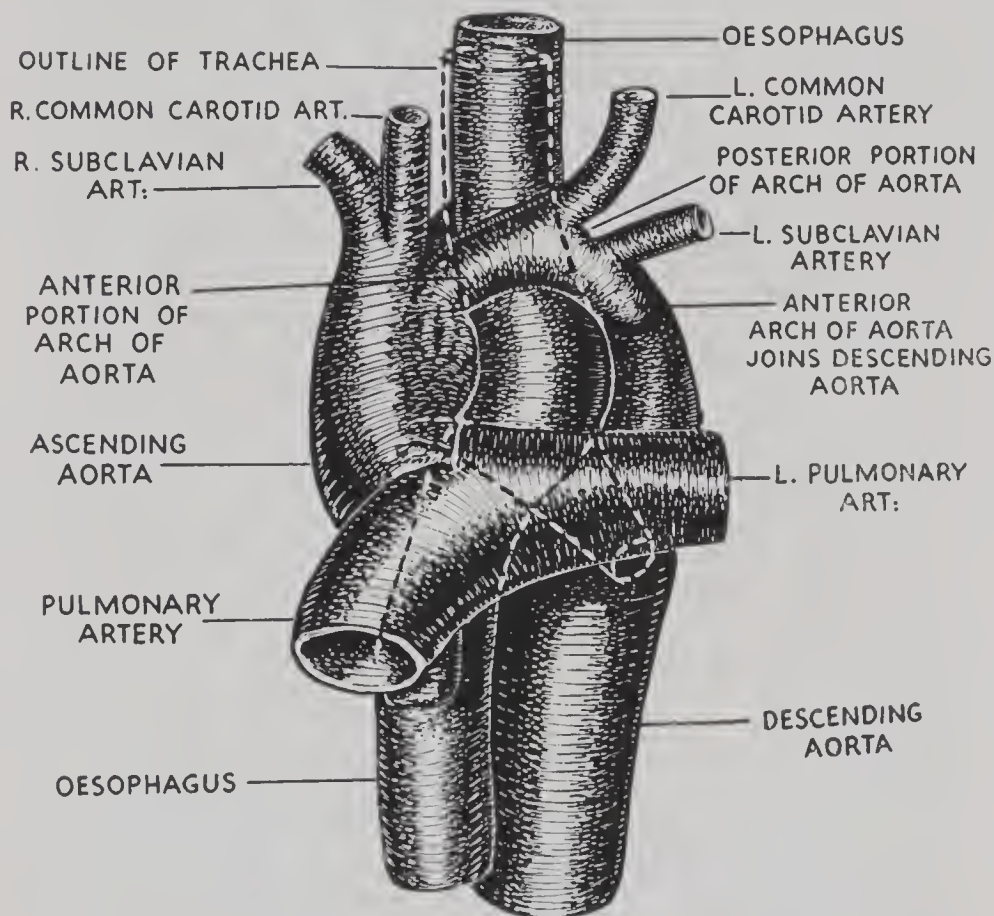


FIG. 66. Diagram of double aortic ring or arch (after H. B. Taussig, "Congenital Malformations of the Heart," 1947, Fig. 149).

The pressure of the encircling aortas may cause attacks of croup in infants, but later in life, as the trachea enlarges, there are usually no symptoms unless, by pressure on the recurrent laryngeal nerve, it leads to a barking cough, or pressure on the œsophagus may cause dysphagia. Double aortic arch was first diagnosed in life by Aaron Arkin in 1925, and he has published an account of six cases in *Amer. Heart Journ.*, 1936, **11**, 444.

We thought that we had now solved the problem, but when I asked the cardiologist to see the patient he diagnosed the condition as one of right-sided aortic arch, with a persistent left aortic root and an aberrant

left subclavian artery. He noted there was no tracheal stridor on exercising the patient and suggested there was possibly a recurrent laryngeal palsy or spasm.

In right-sided aortic arch the aorta is formed from the fourth right aortic arch, the fourth left branchial arch atrophying. There are two main types, in one the aorta arches over the root of the right lung, descends on the right side and crosses the spine lower down to pass through the diaphragm in the normal position. In about 20 per cent of cases right aortic arch is associated with Fallot's tetralogy, and

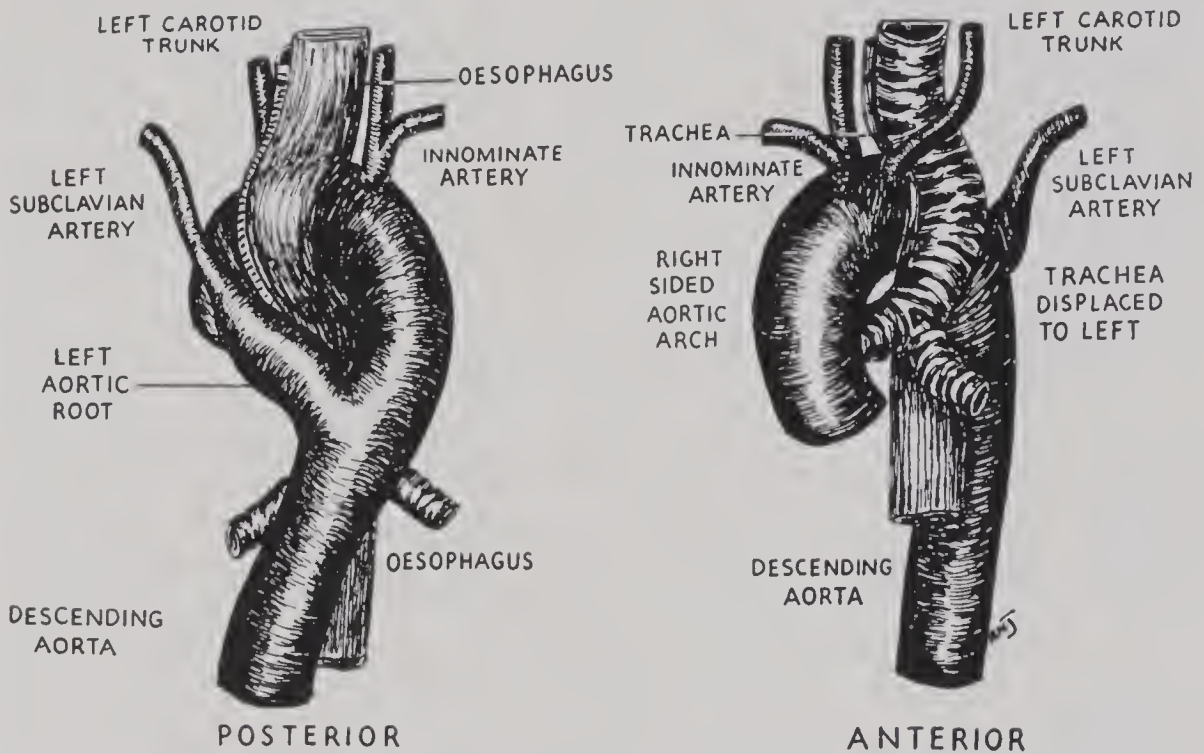


FIG. 67. Diagrams of right aortic arch with left subclavian artery arising from dorsal root of aorta.

occasionally with the Eisenmenger complex. What is the tetralogy of Fallot?

A. It is a congenital malformation of the heart characterized by pulmonary stenosis, hypertrophy of the right ventricle, a ventricular septal defect, and a riding aorta connected with both ventricles.

Q. What are the chief clinical features?

A. Cyanosis and clubbing.

Q. And what is the Eisenmenger complex?

A. It is Fallot's tetralogy without the pulmonary stenosis and without the right ventricular hypertrophy.

Q. To continue, the only clinical symptom which is likely to occur in right-sided aortic arch is stridor and paralysis of the right vocal cord, if the arch is much dilated. Radiologically, when the œsophagus is filled with barium, it is seen that the right aortic knuckle lies to the

right of the œsophagus, and the convexity of the impression made on the œsophagus is to the left, which is the reverse of normal. In the left anterior view, the aorta may or may not indent the œsophagus posteriorly.

In the second type of right-sided aortic arch the aorta descends on the left side, the aorta passing from right to left behind the œsophagus. Bedford and Parkinson (*Brit. Journ. of Radiol.*, 1936, **108**, 776) give three causes for this. The aorta may be pulled to the left by the normal development of the ductus arteriosus on the left side or by the persistence of the strand of the ductus in its normal position. Here we find the left subclavian artery passes in front of the trachea. Alternatively, the left subclavian artery arises from the left aortic root. Here the distal part of the fourth left arch persists and forms an aortic diverticulum at the termination of the aortic arch, and the left subclavian artery arises from the diverticulum and passes behind the œsophagus and trachea. That is considered to be the state of affairs in our case (see Fig. 67).

The third cause is the double aortic arch, diagnosed in this case by the radiologist, in which there is full development of the right aortic arch, with persistence of the left aortic arch. The clinical picture in all three of these conditions is very similar, and Taussig says that a double aortic ring causes changes which are virtually identical with those produced by a right aortic arch and a left descending aorta. Arkin described the following signs in his cases of double aortic arch: 1. Dulness to the right of the sternum. 2. Visible systolic pulsation in the second and third right intercostal spaces. 3. Palpable, strong pulsation in the right supraclavicular fossa. 4. Maximum intensity of the aortic sounds in the region of the head of the right clavicle. 5. Slight displacement of the trachea to the left. 6. Delay in passage of the stomach tube at the level of the third dorsal vertebra, with transmitted pulsation from the arch of the aorta.

Look at the X-ray films again. In the P.A. view (see Fig. 63) you can see the left aortic root shadow below the inner end of the left clavicle, which was at first taken to be the normal left-sided aortic arch. It is smaller than would be expected for a man of his size. The right-sided aortic arch is below the inner end of the right clavicle. The tomogram (see Fig. 64) shows the upper circular shadow of the right aortic arch. In the right anterior oblique view, the œsophagus is seen sharply displaced forwards by a circular shadow of the arch of the aorta behind it (see Fig. 65). Taussig says that no other condition causes such an abrupt curve. The actual distinction on clinical and radiological evidence between a right aortic arch with a left descending aorta due to the three causes we have mentioned—persistence of the strand of the ductus, abnormal origin of the left subclavian artery,

and double aortic ring, can probably only be made by arteriography to show up the origin and course of the vessels.

The laryngologist has reported that there is no laryngeal palsy or spasm. On bronchoscopy there was no evidence of constriction or œdema of the trachea, and no abnormality in the main bronchi.

The chest surgeon thought that the patient obtained relief from lying on the left side, and could not lie on the right, owing to the shift of the mediastinum to the left. This shift was confirmed by taking two X-ray films of the chest, one with the patient semi-propped up and lying on his back, and the other with the patient lying on his left side with the film placed in front of the chest. The apex of the heart moved outwards about 2 in. in the left lateral position. This would tend to relieve pressure on the trachea from the right-sided aortic arch. Bending forwards would tend to increase the antero-posterior diameter of the thoracic inlet, but would not relieve the pressure on the trachea on its right side.

It is possible that the shadow seen lower down in the tomograms, at the level of the bifurcation of the trachea, is due to dilatation of the azygos vein (see Fig. 64).

It was found that gr. 5 of aspirin would rapidly relieve the choking feeling at its onset, and this suggests a functional element in the attacks. The patient is going home, and has been told to take a dose of the aspirin medicine, in which he has great confidence, as soon as he feels an attack to be coming on.

Having been now relieved of the fear of the attacks, which was due to his uncertainty as to their nature, it is hoped that he will improve.

Operations have been suggested to relieve the condition in infants, either division of the cord of the ductus arteriosus, ligation of the left subclavian artery, which is said not to interfere with the blood supply of the arm, or division of the anterior portion of the aortic arch in double aorta.

A CASE OF GIRDLE PAINS

THE patient whom I am asking you to examine this afternoon has a somewhat complicated history and the diagnosis is uncertain, but I expect that you will be able to shed light upon the problem. I will ask my house physician to read the history.

The H.P. reads: Mr. T.A.B. was in this ward nearly three years ago on account of diabetes mellitus. A year before admission a large carbuncle had been excised from the back of his neck at another hospital and the wound was still discharging pus on admission here. There were symptoms of neuritis, tingling in the toes, the knee-jerks and ankle-jerks were depressed, and there was wasting of the shoulder girdle muscles. For some time he had complained of indigestion. The dextrose tolerance curve showed that he had diabetes mellitus, but it was not severe and was controlled with a diet containing C. 150 G., P. 100 G., F. 90 G., and 20 units of soluble insulin morning and evening. The X-ray films of the cervical spine showed no bony changes, the X-ray film of the chest was normal, and the barium meal examination indicated the presence of a small penetrating ulcer on the lesser curvature of the stomach. In addition to the diet given for the diabetes the patient was treated with an alkaline powder after meals, and belladonna and olive oil before meals. A repeat barium meal examination six weeks later showed no evidence of gastric ulcer. During his stay in hospital Antiphlogistine was applied to the carbuncle wound, and, on the patient's discharge from hospital, it was practically healed, and the symptoms of peripheral neuritis in the legs had disappeared.

Eighteen months later Mr. T.A.B. was readmitted here on account of attacks of pain in the right subcostal region of nine months duration which his doctor said were "typical of gall-stone colic." The diabetes was well controlled on a diet containing C. 200 G., P. 100 G., F. 90 G., with 25 units of soluble insulin in the morning and 20 units in the evening. The barium meal showed no abnormality in the stomach or duodenum. The cholecystogram was normal. The blood Wassermann reaction was negative. The blood count was normal. The patient was seen by a surgeon who did not advise an abdominal operation to explore the gall-bladder. There was, however, one fresh finding. The plantar responses were both extensor, there was diminution of sensation to pin-prick over the feet, and the vibration sense was impaired over the lower third of the tibiæ. These signs were thought to indicate some form of lateral sclerosis of the cord.

The patient went home and three months later his doctor wrote: "Since coming home the lateral sclerosis is getting very much worse

and Mr. T.A.B. has had two very severe attacks of pain, of the girdle type, around the upper abdomen. I saw him at four o'clock this morning in the severest agony, cold and shocked, bad pulse, and he was thinking the end had come. Half a grain of morphia relieved this, but he has been very low all day. Can you help me any more with a cause for the pain and any treatment to prevent the onset of the attacks of pain? Forgive my worrying you, but he is such a decent fellow that I should like to do more for him."

Q. Thank you, Dr. L. The patient was admitted here six days later, two weeks ago. Will you examine him now, Dr. P., and tell us what you think is the cause of his trouble.

* * * * *

Q. Have you finished?

A. Yes.

Q. Have you done everything you want to do?

A. Yes.

Q. Well then tell us what you have found.

A. The patient is forty-nine years of age. Single. He is fairly well nourished, but says he has lost a stone in weight in a year. He does not appear anæmic. The tongue is slightly furred and he has complete dentures. There is no family history of diabetes mellitus. The lungs are normal. The heart is not enlarged and there are no murmurs. The brachial arteries are thickened and a little tortuous. The blood pressure is 185/100 mm. Hg. The abdomen is not distended; the abdominal movements are normal. There is no rigidity. The liver is just palpable on deep inspiration and there is slight tenderness in the gall-bladder region. The spleen is not tender. The scar over the site of the carbuncle excision is soundly healed.

Q. What did you find in the examination of the central nervous system?

A. The cranial nerves are normal.

Q. Did you examine the fundi?

A. Yes, they are normal.

Q. No, there is retinal arteriosclerosis, but there are no hæmorrhages and no exudates. What else did you find?

A. The patient says he has noticed slight weakness of both legs for two years, and also some lack of control of the rectum for six months, but urinary control is normal. On examination there is weakness of the left deltoid muscle, and slight weakness and spasticity of the leg muscles. The pupils react normally. The tendon reflexes of the arms are normal. The abdominal reflexes are absent. The knee-jerks and ankle-jerks are present. The plantar responses are extensor. There

is impairment of pin-prick and cotton-wool appreciation over the legs and more so over the lower abdomen. There is a sharp upper level to the alteration in sensation at the level of thoracic 7 root, and tenderness over the 5th thoracic spine. The girdle pain he complains of is at the level of thoracic 9 root, and it is aggravated by sneezing, coughing and straining.

Q. What do you mean by girdle pains?

A. They are pains which encircle the thorax or the abdomen, like a painful tight band. They are due to lesions affecting both dorsal roots of a nerve segment.

Q. What are they due to?

A. Probably the most common cause is tabes dorsalis, but they are also met with in syphilitic spinal meningitis, and in lesions which produce paraplegia, such as a tumour, an abscess, spinal caries or an aneurysm.

Q. Do you think he is suffering from lateral sclerosis?

A. No. There is some lesion affecting the lateral columns, motor and sensory, but it has a definite upper limit in the thoracic cord, so it is probably due to a local lesion causing pressure on the cord, such as a tumour.

Q. Do you want any further investigations carried out?

A. I should like an X-ray of the spine and a lumbar puncture.

Q. The X-ray films are here, they do not show any lesion in the vertebræ. The cerebro-spinal fluid was clear and under normal pressure. The cell count is normal. The protein is increased to 0.4 per cent, which is about ten times the normal, and there is a large excess of globulin. Now, Dr. W., what do you understand by lateral sclerosis?

A. A condition in which there is degeneration of the pyramidal tracts in the spinal cord. Primary lateral sclerosis was described some years ago, but it is hardly referred to in the text-books now, and a primary degeneration affecting only the pyramidal cord tracts probably does not occur. In some cases it is due to disseminated sclerosis, in many others it is associated with lesions in the anterior horn cells, and forms part of amyotrophic lateral sclerosis.

Q. Who described amyotrophic lateral sclerosis?

A. I do not know.

Q. Charcot. He differentiated it from progressive muscular atrophy, but nowadays they are considered as variants of the same disease, often called motor neurone disease. Who was Charcot?

A. A French neurologist.

Q. When did he live?

A. In the nineteenth century.

Q. What is he best known for?

A. For Charcot's joints.

Q. What are they?

A. Painless swellings of the joints, usually the big joints, which are met with in tabes dorsalis and in syringomyelia.

Q. Which joints are usually affected?

A. In tabes the knees, ankles or hip, and in syringomyelia the shoulders or elbows.

Q. What else is Charcot known for?

A. The Charcot triad of signs in disseminated sclerosis, slurring or scanning speech, nystagmus and intention tremors.

Q. This combination of signs is only met with in about 10 per cent of cases. Charcot also described the dissociated sensory loss in syringomyelia, sensations of pain, heat and cold being lost, touch being unaffected. With what disease is Charcot's name associated, Dr. H.?

A. The Charcot-Marie-Tooth type of muscular atrophy.

Q. What is this?

A. It is also called peroneal muscular atrophy or progressive neural muscular atrophy.

Q. Tell us a little about it.

A. The disease is usually hereditary and males predominate. It usually shows itself before the age of ten years. There is symmetrical wasting of the peronei, the extensor communis digitorum and the small muscles of the feet. If the wasting begins in the muscles of the feet there is bilateral pes cavus. Wasting of the peronei causes talipes equinovarus. The hands and forearms are sometimes affected, the hands are clawed. The wasting spreads up the limbs from the periphery, to just above the knee or half-way up the forearm. The wasted leg is said to resemble an inverted Indian club or an inverted champagne bottle. The knee-jerks are present but the ankle-jerks are lost. There are usually some sensory changes over the feet and lower part of the legs.

Q. What is the nature of the lesion? Is it a myopathy?

A. No. It is due to atrophy of ventral horn cells and the corresponding motor nerve roots. There is often an interstitial neuritis of the peroneal nerves and atrophy of the posterior columns of the cord.

Q. Can anyone tell us any more about Charcot?

No answer.

Q. I shall have to ask one of my clerks. They have lectures now on the History of Medicine in the introductory course before they come into the wards. What do you know, Mr. P., about Charcot?

A. He started life as the son of a coachbuilder in Paris and finished up as physician to the hospital of Salpêtrière in Paris. He

married a rich wife and lived in a sumptuous mansion in the Boulevard St. Germain.

Q. I suppose they told you this to encourage you to become a neurologist. Things have changed since then, and you must remember that in addition to marrying a rich wife Charcot was a very hard worker. He founded a world-famous neurological clinic. He is said to have taken great care in preparing his lectures—he did not just think of what he was going to say as he walked across the court-yard to the lecture theatre. He was sarcastic and rather fierce in his manner, and, like most of us, disliked being contradicted. He died in 1893 at the age of sixty-eight of angina pectoris. So much for Charcot, now what about Marie, Mr. P.? Were you also taught about him?

A. Yes, Sir, a little.

Q. Let us have the little.

A. Marie was a pupil and later an assistant of Charcot.

Q. Is that all you know?

A. Yes, Sir.

Q. Marie was born in 1853 and was twenty-eight years younger than Charcot. The Charcot-Marie-Tooth disease was described by Charcot and Marie in Paris in 1886, and in the same year young Dr. H. H. Tooth, aged thirty, described it, in London, in his Cambridge M.D. Thesis. I cannot for the moment think of any other man who has been immortalized by his M.D. thesis, except perhaps Hanot in his Paris thesis of 1875 on “Hypertrophic Cirrhosis with Chronic Jaundice,” but I can think of a good many who have not been.

What else is Pierre Marie known for, Dr. W.?

A. He described hereditary cerebellar ataxia, and the Strümpell-Marie type of rheumatoid spondylitis. He also wrote about acromegaly and he was strongly opposed to Broca’s view that the speech centre is localized in the brain in the third left frontal convolution.

Q. Do you know anything about Tooth?

A. No.

Q. Dr. Howard Henry Tooth was a physician on the staff of the National Nerve Hospital and on Barts. I had the interesting experience of being examined by him in my long case in the Membership at Barts, the case he showed me being one of syphilitic meningomyelitis. I had never seen one before and have never seen one since, and I forgot to test the plantar responses.

To go back now to lateral sclerosis, under what conditions are the pyramidal tracts affected in the cord?

A. In subacute combined degeneration of the cord.

Q. What is this associated with?

A. Pernicious anæmia and less often with other types of anæmia. The posterior and lateral columns of the cord are affected, as in this case.

Q. What conditions may be mistaken for subacute combined degeneration of the cord?

A. Peripheral neuritis, when the sensory changes predominate in the legs. The extensor plantar response would exclude this diagnosis.

Q. What else?

A. Tabes dorsalis, if the posterior columns are chiefly affected. But the cerebro-spinal fluid is normal in subacute combined degeneration of the cord, and in tabes the plantar responses are flexor.

Q. What else has to be considered?

A. Disseminated sclerosis, Friedreich's ataxia and a cord tumour.

Q. The confirmatory diagnostic findings in all cases of subacute combined degeneration of the cord are the anæmia, usually of the pernicious type, the bone marrow which shows usually excess of megaloblasts and erythroblasts, and a histamine-fast achlorhydria.

What do you think is the nature of the lesion here?

A. I think he has a compression myelitis, probably due to a slowly growing cord tumour.

Q. The patient was examined by a neurologist yesterday, and he agrees with you. He thinks, from the length of the history, that the prognosis is good and that the tumour can be removed by operation. What conditions give rise to compression myelitis?

A. Lesions of the vertebræ, such as tuberculosis causing Pott's disease, or syphilis. Tumours of the vertebræ. Paget's disease.

Q. Yes. Anything else?

A. A fracture.

Q. What lesions of the meninges or nerve roots may cause compression myelitis?

A. Hodgkin's disease, leukæmic infiltration, pyogenic infections or tumours.

Q. Are there any other causes? *cervicals(?)*

A. Syphilitic pachymeningitis hypertrophica is an important one. Meningeal cysts are rare. *h*

An aortic aneurysm may very occasionally erode a vertebra and cause compression myelitis.

Q. I am going to ask a neurological surgeon to see the patient and I will let you know later what happens.

* * * * *

The patient was seen by the surgeon who decided to operate. The spines of the sixth, seventh and eighth thoracic vertebræ were exposed and a laminectomy performed. A long strip of granulation tissue was found, distinct from, but pressing on the dura posteriorly. This was removed. Section showed that it was composed of granulation tissue

and it was thought to have arisen as an extradural infection in connection with the carbuncle. The patient did fairly well for a week after the operation when the temperature rose. The wound was opened again and pus was evacuated. The patient then developed left basal pneumonia and died suddenly.

A CASE OF HEADACHE

GOOD afternoon, Dr. W. We are lucky to have you here to-day, you are always such a help in our diagnostic difficulties.

The patient, Mr. K., whom I want you to examine, is seventy-four years of age complaining of headache. When I went to see him in consultation about three weeks ago, the doctor said to me as we were going up the stairs, "This case will suit you. He has been seen by five specialists and no diagnosis has been made." My heart did not exactly jump for joy when I heard this. Despite popular opinion not all consulting physicians consider it beneath their dignity to be called out to see a straightforward case. It is a relief.

I will read you the history which we have compiled from what the general practitioner told me, from the patient's story, and from the report received from a registrar of a hospital where he was an in-patient for ten days about six weeks ago. Prostatectomy was performed six years ago. Three years later Mr. K. attended another hospital as an out-patient, on account of anginal pain. An electrocardiogram was thought to show evidence of a small, recent, anterior infarct. The blood Wassermann reaction was negative, and X-rays of the chest and barium meal showed no abnormality. Nine months ago Mr. K. again attended the same hospital complaining of dysphagia. A barium swallow examination showed no abnormality.

The headache began about four or five months ago. The patient says it was severe and situated in the occipital, left temporal and vertical regions of the skull. It was not constant and would come and go at any time in the day. He attended the out-patient department of a second hospital, where a diagnosis of *neuralgic fibrositis* was made. The blood pressure was 130/70 mm. Hg. The headache was treated with Gowers' mixture. What is Gowers' mixture, Dr. W., and who was Gowers?

A. He was a neurologist.

Q. True. Is that all you know about him?

A. He described a distal type of myopathy, and the anterior spino-cerebellar tract is called Gowers' tract.

Q. Do you know anything else about him?

A. No.

Q. Sir William Gowers was an F.R.S., and physician to University College Hospital and to the National Hospital for the Paralysed and Epileptic. He died in 1915, at the age of seventy. He was a contemporary of Hughlings Jackson, described as the father of modern neurology. Gowers was one of the first to recognize the importance

of ophthalmology in general medicine and wrote "A Manual and Atlas of Medical Ophthalmoscopy." He also wrote "A Manual of Diseases of the Nervous System." Dr. P., you come from Greece, what is Gowers' mixture?

A. We have not heard of it.

Q. Does anyone know?

Someone at the back answers that it contains gelsemium.

Q. If you look up hospital pharmacopœias you will find various prescriptions which are called Gowers' mixture. If you go to the source and look up the article on "Migraine" in Gowers' Manual you will find that Gowers does not give a complete prescription. He recommends the use of Liq. trinitrini combined with tincture of nuxvomica, tincture of gelsemium and dilute phosphoric acid. He says that the liq. trinitrini is more efficacious than the tablets and tells us that the liq. trinitrini is decomposed by alkalis and must be given with acids. He further recommends that the mixture should be given between the attacks of migraine, and not during them, as is sometimes stated. He considered that it might act "chiefly by periodically flushing the nerve centres with arterial blood and so improving the nutrition and function of the nerve cells." If you want the reference, it is W. B. Gowers, "Manual of Diseases of the Nervous System," 1888, Vol. 2, p. 793, J. and A. Churchill, London.

The prescription which is often used now is Sod. brom. gr. 10, liq. trinitrin. m. 2, acid. hydrobrom. dil. m. 5, tnc. nuc. vom. m. 5, tnc. gelsem. m. 10, syrup limon. m. 60, aq. ad. fl. oz. $\frac{1}{2}$. What is gelsemium?

A. It is obtained from the root of the yellow jasmine.

Q. Correct. And now to continue the history.

The medicine did him no good and he looked worse. About six weeks later he consulted a neurologist privately who suggested the headache might be due to *ethmoidal sinusitis*. Treatment with Theominal tablets was advised, but his condition rapidly deteriorated, the headaches were very severe and ulcers formed in the mouth. What, Dr. W., are Theominal tablets?

A. They are a proprietary preparation.

Q. What do they contain?

A. Theobromine, I think.

Q. Yes, and phenobarbitone. Theobromine gr. 5 and phenobarbitone gr. $\frac{1}{2}$ in each tablet. The B.P. preparation is Tab. phenobarbitoni et theobrominæ. Two weeks later he was seen by a general physician on the staff of another teaching hospital. The patient was now very drowsy and a diagnosis of *uræmia* was made. He was admitted to hospital for a week. No evidence of *uræmia* was, however, found. The blood urea was 42 mg./100 c.c. X-ray of the chest showed cardiac enlargement with slight basal congestion. Transient auricular

fibrillation was noted. The blood pressure was 130/90 mm. Hg. Culture of the urine was sterile. The blood count showed Hb. 88 per cent, White cells 10,500 per c.mm. An electrocardiogram was taken, the report being "Sinus rhythm at the rate of 80 per minute, with occasional auricular premature beats. Prominent Q waves in standard leads 2 and 3, in unipolar aVF, and V.3. T inverted in V.2-V.6, and almost flat in standard and in unipolar limb leads. Changes due to extensive anterior cardiac infarction." The condition was not thought to be recent.

The electrocardiograms are here—those taken three years ago and six weeks ago—there is no significant change and the appearances suggest cardiac ischaemia rather than cardiac infarction. The patient was discharged from hospital with the recommendation to his doctor that he should convalesce slowly. What he was to convalesce from was not stated, no cause for the headache was found, and no treatment recommended.

I saw the patient nine weeks after his discharge from hospital. The doctor told me that the drowsiness was better and that the ulcers had disappeared from his mouth, but his relatives had noticed a distinct mental change. Formerly he would joke, now he was very depressed.

Dr. W. now examines the patient.

* * * * *

Q. Will you tell us what you have found?

A. The patient does not look ill, but he is depressed because of the headache. There is no evidence of anæmia. The heart is not enlarged and there are no murmurs. The blood pressure is 135/75 mm. Hg. The brachial arteries are not thickened. The fundi are normal. The urine contains no albumin and no sugar. The lungs and abdomen are normal. The central nervous system is normal.

Q. What do you think is the cause of the headaches?

A. They may be due to *cerebral arteriosclerosis*.

Q. There is no evidence of peripheral arteriosclerosis. The eye specialist has seen him and reports "There are lenticular opacities in both eyes, largely peripheral. There is no gross arteriosclerosis." How would you propose to investigate the cause of his headaches?

A. I should like an X-ray of the skull, to see if it shows any thinning of bone which might be caused by a cerebral tumour, such as a meningioma.

Q. The diagnosis here is certainly difficult, but "nothing clears up a case so much as stating it to another person." One way of attempting to solve the problem is to consider the causes of headache and see

which can be eliminated. What are the intracranial sources of headache?

A. The structures inside the skull which are sensitive to pain are the venous sinuses, the basal dura and the arteries. The V, IX and X cranial nerves, and 1, 2 and 3 cervical nerves, are also pain sensitive. Most of the dura and pia is insensitive.

Q. The arteries in the tissues covering the cranium are also pain sensitive. We can classify the intracranial sources of headache as due to traction on the veins passing to the venous sinuses or to displacement of the sinuses; to traction on the middle meningeal arteries or the large arteries at the base of the brain; to distention of the intracranial arteries; to inflammation around the pain sensitive structures in the skull, or to pressure by tumours on the cranial and cervical nerves. From the clinical point of view how would you classify the varieties of headache?

A. Headache may be due to changes in the intracranial pressure.

Q. A fall of intracranial pressure which results from removing 20 c.c. of cerebro-spinal fluid, with the patient in the erect position results in headache, which is relieved by injecting saline. This is probably a traction headache, caused by pulling on the venous sinuses or arteries. Increasing the pressure of the cerebro-spinal fluid up to 550 mm. does not, however, produce headache, so that increased intracranial pressure in itself is probably not a cause of headache. What other causes are there of headache?

A. A space-occupying lesion.

Q. Oh, blessed term! Oh, happy cliché! What does it mean?

A. Generally a tumour or abscess, less often a gumma or tuberculoma.

Q. What is the character of this type of headache?

A. It is sometimes throbbing, but more often a dull, deep, ache. It is usually intermittent. It is often worse in the early morning, on coughing, vomiting or straining at stool.

Q. This type of headache is also probably due to traction on pain sensitive structures in the skull. It is situated over the site of the tumour in about one-third of the cases. In posterior fossa tumours the pain is usually occipital. It is rarely occipital in supratentorial tumours unless there is papilloedema. What is another cause?

A. Histamine headaches.

Q. What is the character of the pain here?

A. It is throbbing.

Q. Skin tests show an increase sensitivity to histamine; we discussed this not long ago in another case (see p. 125). It is due to dilatation and stretching of the pial and dural arteries, chiefly the large arteries at the base of the brain. Increasing the intracranial pressure

by injecting saline into the cerebro-spinal fluid relieves the headache, by supporting the arteries at the base of the brain. What other throbbing headaches are there?

A. Migraine and the headache which occurs in fevers.

Q. In migraine the external carotid arteries are chiefly affected, and pressure on them relieves the headache. Raising the pressure of the cerebro-spinal fluid up to 800 mm. does not relieve the headache, which indicates that the dural arteries are not affected. Ergotamine tartrate relieves the headache by diminishing the pulsation of the external carotids. How does high blood pressure cause headache?

A. By distending and dilating the branches of the external carotids.

Q. Yes. It may be relieved by pressure on the temporal, frontal, supraorbital, posterior auricular or occipital arteries, and by ergotamine tartrate. What do you mean by tension headache?

A. I don't know.

Q. It is a very common form of headache, associated with emotional tension which causes contraction of the neck and head muscles, and results in pain in the shoulders, neck and head. There is tenderness on pressure over the trapezius muscles. The patient often complains of pain, or of a feeling of pressure, or of parasthesia over the vertex of the skull. What other causes of headache are there?

A. Ocular disturbances.

Q. Such as?

A. Disturbances of muscle balance, errors of refraction, or glaucoma.

Q. With ocular headaches the electromyogram may show abnormalities in the muscles of the scalp or neck. Persons who are myopic are not so likely to suffer from ocular headaches, as they do not contract the ocular muscles to improve their vision as do the hypermetropes. Contraction of the ocular muscles would make vision worse for the myope. Is there any other common cause of headache. What do you say, Dr. C.?

A. Sinus headache often occurs.

Q. When is a frontal sinus headache likely to occur, and when an antral sinus headache?

A. An antral headache often comes on in the afternoon, but with frontal sinusitis the patient wakes with the headache and it wears off as the day goes on.

Q. And what about sphenoidal and ethmoidal headaches?

A. The pain is usually at the back of the eyes and over the vertex.

Q. In all these sinus headaches the pain is often worse on lowering the head. Headache may also be a symptom of general diseases or disturbances such as chronic nephritis, anæmia, alkalosis, and syphilis.

Drugs such as quinine, strychnine, iron, alcohol, and carbon monoxide poisoning may cause headache. Various types of functional headache are described: The “*clavus hystericus*” is a boring sensation on the vertex of the skull. Mental strain, venous congestion from a tight collar, motion sickness, sunstroke, the noise of guns, etc., are other causes.

We can also classify headaches symptomatically. Thus throbbing or pulsating headaches are met with in migraine, fevers, histamine sensitivity, high blood pressure and pulsating hæmangiomatic tumours. A sensation of a tight band or cap, or a feeling that the head is being compressed in a vice is usually due to emotional disturbance or to sinusitis. A steady, dull ache is associated with cerebral tumour. Headache due to subarachnoid hæmorrhage is very severe. Intracerebral hæmorrhage rarely causes headache unless the bleeding extends into the ventricles and subarachnoid space. Bitemporal headache may be due to a pituitary tumour or be associated with menstruation. An aneurysm in the circle of Willis or a chronic subdural hæmatoma is likely to produce a persistent unilateral headache. If you are interested in the classification and causes of headache you should look up the article by H. G. Wolff in *Clinics*, 1944, 2, 1394.

Now Dr. W., how does the patient describe his headache?

A. He says it is a severe aching. It does not throb, although sometimes he feels a rushing noise in the head. It is chiefly occipital and vertical, but sometimes frontal or left temporal. It may occur at any time in the day.

Q. Is there any evidence of brain tumour here?

A. No. I do not think so. There is no vomiting and no papilloedema.

Q. What further tests would you want to exclude a brain tumour?

A. An electro-encephalogram, a lumbar puncture, an X-ray of the skull, and a ventriculogram.

Q. Before we come to the results of the investigations, let us complete the clinical examination. Look at the patient again, Dr. W., and tell us if you have missed anything.

A. I cannot see anything else.

Q. But surely you are struck by the appearance of his head. It was the first thing I noticed when I saw him. Do you not observe the marked saddle-bridge deformity of the nose? Look how large his skull is compared with the size of the face. The calvarium is massive, square, with a prominent forehead. It may have always been so, but I noticed his photograph in the bedroom, taken when he was a young man. He had a large head then, but not as large as it appears now. I enquired what size hat he takes, and he answered 8½. As my hat is 6¾ I asked to see his hat. A new hat was produced from the wardrobe,

and on looking inside I found the size was $7\frac{3}{8}$. What is the circumference of his head? Have you measured it?

A. No.

Q. Well, will you do so.

A. It is $23\frac{1}{4}$ in.

Dr. K. says, I have a large head. When I was an undergraduate the students used to say I was hydrocephalic.

Q. What size hat do you take?

A. I do not know, I know the circumference of my head is 57.5 cm.



FIG. 68. Skull showing slight thickening of calvarium.

Q. How many inches is that?

A. 23 in.

Q. What do you do when you want to buy a new hat? Do you say "I want a hat. The circumference of my head is 23 in.?"

A. Yes!

Q. Well, the patient has a large head and there is slight bossing in the right temporal region. What does this suggest?

A. Paget's disease.

Q. And the saddle-bridge depression of the nose?

A. Congenital syphilis.

Q. Do you think Paget's disease could account for the headache?

A. Yes. Headache is a fairly common symptom in Paget's disease. The rushing sound he described might be due to the increased vascularity of bone which occurs in Paget's disease.

Q. I expect now you would like to know the results of some of the investigations. First the renal function, as chronic uræmia may cause headache. The urine contains no albumin and no sugar. No casts were found. The blood urea is normal, 31 mg./100 c.c. The Van Slyke renal function test is 55 per cent. This is below normal, so there may be an element of renal failure. The blood Wassermann is negative,



FIG. 69. Lateral view of skull showing evidence of advanced Paget's disease. Considerable thickening of outer table and diploë. Commencing involvement of inner table in occipital region and amorphous changes throughout vault.

it is unlikely that he has syphilis. The blood count is Red cells 4.85 millions per c.mm., Hb. 83 per cent, White cells 6,900 per c.mm., differential count normal. There is not sufficient anæmia to cause headache. The sedimentation rate of the red cells is raised to 48 mm./1 hour (Westergren). X-ray of the sinuses show the right antrum is opaque—so there may be infection here accounting for the anæmia and increased sedimentation rate. Here is the X-ray of the skull. There is thickening of the calvarium (see Fig. 68), suggesting the possibility of Paget's disease—but not being diagnostic. The radiologist does not think that Paget's disease is present. Compare it with the X-ray of the skull of a patient in the other ward showing well

marked Paget's disease (see Fig. 69). She had facial palsy on the left side probably due to narrowing of the stylo-mastoid foramen. The electro-encephalogram shows no evidence of a cerebral tumour or of raised intracranial pressure. It is slightly abnormal, the slow dominant alpha rhythm of 7 to 8 cycles per second, being disturbed in all areas by occasional 5 cycles per second wave. This type of E.E.G. is frequently seen in elderly people. The alkaline and acid phosphatase content of the blood are normal. X-ray of the cervical spine shows narrowing of the discs between C. 5, 6 and 7, probably due to disc degeneration. The bones in the dorsal spine are osteoporotic. The patient has been seen by the E.N.T. surgeon who found thick pus in the right antrum, and, despite six wash-outs, the antrum still contains pus. There is no change in the electrocardiogram from the one taken before admission here, the findings are those of cardiac ischæmia and not of coronary thrombosis. X-ray of the chest shows the heart slightly enlarged and the aorta uncoiled, indicating some atheromatous change. These investigations therefore indicate that the patient has: (1) Chronic infection of the right antrum. (2) Mild anæmia and increased sedimentation rate, probably due to the infection. (3) A slight degree of renal failure. (4) Atheroma of the aorta, and probably other vessels are affected to some extent by arteriosclerosis.

The headache is not pulsating so we can exclude migraine and histamine headaches. There is no fever and the blood pressure is not raised. The most likely cause of the headache is deficient cerebral circulation due to cerebral arteriosclerosis with a tendency to low blood pressure. The headache has been very variable since admission to hospital. On one day it was on the right side, on the next on the left, and later in the occipital or frontal region. The treatment given has been the administration of Coramine by mouth, 15 drops t.i.d. and the patient says the headache is improving; on some days he is quite free from it.

* * * * *

Four months later I was informed that the patient had lost his headaches and was leading a normal life.

A CASE OF PAINS IN THE HEAD, LEGS AND BACK

I DO not think you will have any difficulty, Dr. B., in discovering what is the matter with this patient, but it makes a change to show occasionally a classical example of a well-known, although somewhat uncommon disease. It also exemplifies the fact that in medicine, as in surgery, the diagnosis can sometimes be made by inspection alone.

The patient is a widow, seventy-nine years of age. I was asked to see her twelve days ago, chiefly on account of headache which had troubled her for six months and which was becoming more intense. She said that the pain in the head was throbbing, situated chiefly in the frontal region, and she felt that she wanted to support her forehead with her hands. She also told me that her ribs were painful, that she had been deaf for four years, and that there was a sensation as of rushing water in the left ear. Three months ago she fell and broke her right clavicle, and a year ago she stumbled and fractured her left wrist. We will leave you now, Dr. B., to ask any other questions and to examine the patient, while we divert ourselves with a few X-ray films.

* * * * *

Q. Well, Dr. B., what else have you discovered in the history?

A. Mrs. K. has had eleven children, and eight are alive and well. One child was still-born, one died of lung abscess, and the third succumbed to erysipelas. The patient has seven brothers and sisters, but she does not know anything about them, as they emigrated to various parts of the world. Her husband died of cancer of the lung. Her mother lived to the age of eighty-six, and her father died of dropsy when he was forty years old.

Q. There is nothing very significant in the family history. What else have you found out about the patient's past history?

A. Mrs. K. had scarlet fever when she came of age, and this was followed by an abscess in the neck. Twenty-seven years ago she suffered from headaches, about the time of the "change," but they disappeared. The onset of her present illness was probably eighteen years ago, when she was sixty-one years old. She then had "terrible pains in the back," all the way up the spine, and also pains in the pelvis and hips. She attended a hospital in London for treatment. Twelve years ago she noticed her right foot was enlarging and her right leg began to twist. Ten years ago she went to hospital again on account of pains in the right loin which she thought might be due to kidney trouble. After this she kept fairly well for four years. She then had

trouble with her eyes. The first symptom was that the letters jumped about when she was reading, and at times her sight became misty. She was told she had cataract in the right eye. The sight has become much worse lately. Three years ago she noticed both legs were becoming bent, and recently her head has become larger. It is tender to touch and feels sore. For the last ten months she has been feeling bewildered. She does not know what is going on, and forgets what she wants to do. The top of her head feels very heavy, and she wants to lift it. The deafness has become worse since an attack of influenza six weeks ago.

Q. This is a fairly typical history of a slowly progressive disease extending over many years. Did she tell you anything about her height?

A. Yes, she is not so tall as she used to be.

Q. What did you find when you examined her?

A. One has only to look at her head to see she has Paget's disease.

Q. Why?

A. She has a very large head.

Q. There are other conditions besides Paget's disease which cause a large head. What are they?

A. Rickets, syphilis, leontiasis ossea and osteo-malacia.

Q. Yes, and hydrocephalus, and oxycephaly or "Turmschädel" about which we talked one afternoon ("Applied Medicine," p. 341). How has the shape of the head in Paget's disease been described?

A. Like a triangle with the base upwards.

Q. In what condition do you find the reverse shape, the apex of the triangle being above and the base below?

A. In acromegaly.

Q. Who pointed this out?

A. Virchow.

Q. No, it was Pierre Marie. What is the circumference of the patient's head?

A. I have not measured it.

Q. I thought you said you had examined her. Here is a tape measure.

A. The circumference is $23\frac{1}{2}$ in.

Q. This is 2 in. more than the average circumference of a woman's head. What about the rest of the skeleton. Ask her to stand out of bed.

A. There is kyphoscoliosis.

Q. What is her height?

A. I have not measured her.

Q. She is 5 ft. 2 in. tall, and she used to be 5 ft. 6 in. What else do you notice?

A. The chest appears narrowed from side to side. The neck is short. The thorax seems to be shortened, the pelvis is wide, and the tibiae are bowed forwards.

Q. She is able to approximate the knees which is often not the case in Paget's disease, owing to an outward and forward bowing of the femora. The right foot is everted. The arms look long, and the



FIG. 70. Patient suffering from Paget's disease of bone.

hands reach down to the lower part of the thighs (see Fig. 70). What else did you find when you examined the legs?

A. The right tibia is more bowed forwards than the left and both bones are tender.

Q. What did you find on palpation?

A. The right tibia is broader than normal, and some transverse lumps can be felt on it.

Q. What else did you notice on palpation?

A. Nothing.

Q. Dr. P., place your hand first on the right tibia and then on the left, and tell us what you feel.

A. The bones are firm.

Q. Yes—did you expect them to be soft because they are curved? Put your hand on them again. What do you appreciate apart from tactile sensations?

A. The skin over the right tibia is hotter than the skin over the left tibia.

Q. Yes. We have taken the skin temperatures. On the right



FIG. 71. X-ray of pelvis in Paget's disease.

the temperature is 91° F., on the left 85° F. Do you think this observation is of any importance?

A. Yes. It is due to the increased vascularity of the bones in Paget's disease.

Q. It is said that the blood flow through the affected bones may be increased to twenty times the normal, probably due to arterio-venous shunts. This may result in what is called high output cardiac failure. What bones are usually affected in Paget's disease?

A. Only one bone, such as the clavicle, or a pelvic bone may be affected. This is called the monostotic variety. Usually several bones

are affected, especially the bones of the pelvis, the vertebræ, the femur, the tibia, the skull, the clavicle, the humerus and the radius.

Q. What are the radiological appearances of the bones in Paget's disease?

A. The bone may appear spongy with criss-cross trabeculæ, or amorphous showing in the X-ray film as an opaque deposit.

Q. What are the pathological changes?

A. There are irregular areas of osteoporosis, which lead to



FIG. 72. Patient seven years ago.

softening and bending of the bone, and later new bone formation occurs owing to the activity of osteoblasts.

Q. Here are the X-rays of the skull, and of the pelvis (Fig. 71). The skull shows the uneven thickening of the outer table, a soft cotton-wool appearance of the bones of the vault and some denser areas. The pelvis shows the spongy changes. All the bones have been X-rayed in this patient and changes characteristic of Paget's disease have been found in the skull, the ribs, the clavicles, the right scapula, the head of the right humerus, the left ulna, the left radius, the sacrum, the pelvis,

the femora, the tibiæ, the fibulæ and the right fourth and left fifth metacarpals. I have a photograph here showing the patient's appearance seven years ago, before the head was affected. You will see what a remarkable change has been effected in a comparatively short time (see Fig. 72). Before considering the other investigations we will see what you know about the history of this disease. Who was Paget?

A. He was Sir James Paget, a surgeon, on the staff of Barts.

Q. When did he describe this disease?

A. I think about fifty years ago.

Q. It was sixty-seven years ago. He read a paper on it before the Royal Medical and Chirurgical Society of London on November 14th, 1876. I have the volume here in case you should care to study it, and it is well worth your while to do so. Not even Dr. B., who has examined this patient, could I think write a better clinical description of the features of the disease. The article is entitled "On a Form of Chronic Irritation of Bones (Osteitis Deformans)," and the reference is *Med-Chir. Trans.* (London), 1877, 60, 37. Paget was sixty-two years old when he described this disease. As you will see from this photograph he was a very handsome man. He always worked at high pressure or, as he said once, "to within an inch of my life." In addition to being President of the College of Surgeons he was Serjeant Surgeon to Queen Victoria. Now I think it would do you good if I read some abstracts of Paget's description of the disease. The original patient, before the disease began, was a tall, thin, well-formed man, who lived in rather a cold, damp place in the North of England. He first showed signs of the disease at the age of forty-six. The early symptoms were aches and pains in the thighs and legs, chiefly after exercise. A year later the patient noticed the left shin was misshapen. Paget saw him for the first time two years after this. He found the left tibia broad, especially in the lower half, with an uneven surface. He diagnosed the condition as periostitis and prescribed iodide of potassium and liquor potassæ, which did no good. Three years later the left tibia had become curved anteriorly. The left femur was also now enlarged and arched forwards and outwards, so that the left knee could not be brought in contact with the right. The left leg was a quarter of an inch shorter than the right, and there was widening of the pelvis on the left side. The patient now noticed the right side of his head enlarged, but the enlargement was not yet clearly visible.

During the succeeding seventeen years the left femur and tibia became larger, heavier and somewhat more curved. Very slowly the bones of the right leg followed the same course, until they gained very nearly the same size and shape. The knees gradually became bent and the skull enlarged. The patient was a member of the Yeomanry Corps, and in 1844 he wore a shako measuring $22\frac{1}{2}$ in. inside; in 1876 his hat

measured $27\frac{1}{4}$ in. inside. Paget adds "in its enlargement, however, the head retained its natural shape and, to the last, looked intellectual, though with some exaggeration."

The spine slowly became curved and almost rigid. The cervical and upper dorsal spine formed a strong posterior, not angular, curve and an anterior curve of similar shape was formed by the lower dorsal and lumbar spine. The patient's height fell from 6 ft. 1 in. to 5 ft. 9 in. The chest became flattened from side to side, and deep from before



FIG. 73. The first case described of Paget's disease (*Med.-Chir. Trans. (London)*, 1877, 60, 37).

backwards. The chest movements were restricted. The head was advanced and lowered so that the neck became very short, and the chin, in a position of repose, was an inch lower than the top of the sternum. The abdomen was short and broad, the pelvis wide and low. The arms appeared unusually long, the hands hung low down by the thighs and in front of them. The attitude on standing looked simian—I think this is a very happy simile—sharply in contrast with the large head and handsome feature. The upper limbs remained perfect. Here is a photograph of Paget's patient (see Fig. 73). In January 1876 the patient developed a carcinoma of the upper third of the left radius, and

he died in March 1876 from heart failure with right-sided pleural effusion. Mitral regurgitation had first been noted in 1870. The malignant disease of the radius was probably what we now call osteogenic sarcoma which has been recorded in 28 per cent of one series of 71 cases of Paget's disease.

This is, I think, a wonderful clinical description of the case, which we could not improve on. Paget considered that the bones most often affected are those which bear weight, whereas Albright in America, more recently, has suggested that the bones affected are those subjected to the tension of muscular contractions; and that the head is affected owing to the contraction of the temporal muscles, which seems to me to be a very unlikely event.

Is there anything in the history of this patient which might have predisposed to the development of Paget's disease in the legs?

A. I do not think so.

Q. She did not confide in you then that up to the age of thirty she spent a great part of her life on the stage as a "principal boy" and as a ballerina.

A. No.

Q. Paget concludes his paper with an account of the post-mortem findings. The chemical analysis of the bones showed no abnormality. The pathologist, Dr. Butlin, considered that only three conditions could produce the bony changes, a new growth (tumour), hypertrophy, or chronic inflammation. Of these he said only chronic inflammation could be responsible. He found the changes in the long bones indicated a greatly increased quantity of blood in the bone vessels. The periosteum and medulla were not affected.

After this interlude we will return to our patient. Are there any further investigations you would like carried out?

A. I should like the blood examined for calcium, phosphate and alkaline phosphatase.

Q. What do you expect to find in Paget's disease?

A. The phosphate and calcium should be normal and the alkaline phosphatase considerably raised.

Q. We have these results. The blood calcium is 9.7 mg./100 c.c., the phosphate 4.2 mg./100 c.c., and the alkaline phosphatase is 120 units/100 c.c. What do you think of these figures?

A. The calcium and phosphate are normal, the alkaline phosphatase is very high, the normal range being 3 to 13 King Armstrong units per 100 c.c.

Q. Dr. V., you usually help us with biochemistry. What is the significance of a high alkaline phosphatase reading in bone disease?

A. The alkaline phosphatase is made in bone in osteoblasts, which increases the concentration of phosphate ions by hydrolysing

salts of phosphoric esters carried to the bone in the blood stream. This results in deposition of calcium phosphate around and in the osteoblasts.

Q. A very learned answer, which I trust is correct. Is the plasma alkaline phosphatase always raised in Paget's disease?

A. Yes—the books say so.

Q. Well then, I do not agree with the books. It is sometimes said that in the monostotic form of Paget's disease, in which only one bone is affected, the alkaline phosphatase is normal, but we have seen cases in these wards in which several bones have been affected, and in which the patient is suffering from pains, with a normal alkaline phosphatase.

Is there any other chemical examination which may be of interest in Paget's disease?

A. Nothing that I know of.

Q. What do you say, Dr. R.?

A. I think the calcium content of the urine is often increased.

Q. Yes, it may be four times the normal amount and it does not appear to be related to the duration of the disease or the type of bony lesion as shown by X-rays. What do you think of the deafness?

A. It may be due to the Paget's disease.

Q. Do you mean that the auditory nerve may be compressed by the bony changes?

A. Yes.

Q. It is usually said that there is no narrowing of the foramina of the skull in Paget's disease. The Ear Surgeon has examined the patient and he reports "There is moderate conduction deafness in both ears, almost certainly due to the Paget type of otosclerosis." Did you examine the eyes, Dr. B.?

A. Yes. I think there is cataract in both eyes—I could not see the fundi clearly.

Q. The ophthalmologist does not appear to agree with you. He reports: "There are very extensive changes involving the macula in each eye. These changes originate in the choroid and are not uncommonly associated with Paget's disease." I have looked up the subject, and find all sorts of eye lesions have been described in Paget's disease, including diplopia, proptosis, optic atrophy, cataract, retinal hæmorrhage, choroidal degeneration and macular changes. It is possible that the retinal changes are due to the arteriosclerosis which frequently occurs in Paget's disease. Bony lesions in the orbit may cause proptosis, diplopia or optic atrophy. Our patient has arteriosclerotic changes in the legs as shown by the X-rays.

I read you a little of Paget's account of the post-mortem findings. How would you describe the dried bones in Paget's disease?

A. A bone like the femur or tibia appears pitted on the surface, it has lost the appearance of ivory bone.

Q. It can be described as lighter, thicker and, in places, softer than normal. It may be so soft that it can be cut by a knife. What other changes are there?

A. Under the periosteum there may be areas of thickened bone.

Q. What about the medullary cavity?

A. It is often compressed and narrowed.

Q. Does this result during life in any failure of bone marrow function?

A. No. There is no leuco-erythroblastic anæmia, no agranulocytosis, and no purpura due to deficient platelet formation.

Q. We have already said that Paget considered the disease was inflammatory in nature. This view is not held now. What do we think is the cause of Paget's disease, Dr. M.?

A. The cause is not known, but it is generally held to be a local disease of bone, and not a general disease.

Q. Well, what views have been held as to its etiology?

A. It has been suggested that it is due to an unknown toxin.

Q. And what else?

A. Some writers have suggested it is due to an endocrine disturbance, especially to hyperparathyroidism.

Q. This view is not usually accepted, the bone changes are unlike those found in generalized osteitis fibrosa, and there is no rise in the blood calcium.

A. *Dr. B. intervenes:* Telfet in Cape Town suggested that Paget's disease is due to what he described as "a failure of one facet of phosphate metabolism." He thinks there is a condition of secondary or compensatory hyperparathyroidism resulting from accumulation of phosphates in the blood. This results in mobilizing calcium ions from the bones, with softening of the bones. When the parathyroids cease to respond to the phosphate stimulus, which is likely to be the case in older people, a state of relative hypoparathyroidism ensues and deposition of calcium salts occurs, which leads to the hardening of the bones in the second stage of the disease. Telfet published his paper in the *South African Medical Journal* in 1952. I will bring you a copy of the paper next week.

Q. Thank you very much. I am sure I shall read it with interest. I presume you come from South Africa.

A. Yes. Telfet also believes that the monostotic form of Paget's disease is not Paget's disease at all. He says it is a fibrous disease of bone.

Q. I am afraid we must say that the cause of Paget's disease is

unknown, despite these various theories. How would you treat a case of Paget's disease, Dr. K.?

A. It is important not to immobilize the patient in bed.

Q. Why?

A. If the patient is kept strictly in bed for some time there is a fall in the serum phosphate and increase of calcium excretion in the urine, so much so that the patient may, as they say, pass his skeleton in the urine and suffer a chemical death from loss of calcium.

Q. We do not know any cure for Paget's disease. Osler in his "Textbook of Medicine" wrote "treatment seems to be of no avail." I have found that deep X-ray treatment often relieves the pains. What else is usually recommended?

A. A diet rich in calcium, phosphorus and vitamins. Twenty thousand units of vitamin D should be given daily, and 1,000 mg. of ascorbic acid. If the patient is confined to bed a low calcium diet should be given.

Q. Has any other treatment been suggested, Dr. B.?

A. Yes. Telfet has found that patients improve with the administration of soluble aluminium salts. They lose their pains and feel better. The mixture he prescribes contains Liq. alumin. acetat. (B.P.) fl. oz. $1\frac{1}{4}$, syrup m. 360, ess. cherry conf. opt. m. 4, mel depurat. (B.P.) ad fl. oz. 4. M. 60 q.i.d. p.c. The aluminium is said to combine with phosphate in the intestine and prevent its excretion in the urine.

Q. This is highly interesting, because I have been making enquiries in our hospital dispensary to see if I could find out how Paget's disease was treated here forty years or so ago. They turned up a prescription and it is written on the card that it is for osteitis deformans. It has not been used for many years. The prescription is Liq. alumin. acetat. m. 150, syrup m. 90, flavouring q.s., honey ad fl. oz. 1. M. 60 q.i.d. This bears a strange resemblance to the one you have quoted!

"The thing that hath been it is that which shall be, and that which is done is that which shall be done: and there is no new thing under the sun"—not even in South Africa.

A CASE OF PIGMENTATION OF THE SKIN

THE doctor who asked me to see this patient sent the following introductory note:—"The above is very bronchial and dyspnœic. She has had slight traces of glycosuria for the past three years and has never taken insulin. She is very frail and thin, and the family are beginning to get worried about her. I would be very grateful for your opinion and investigation of her." I examined the lady on February 11th, 1953, and two days later she was admitted to hospital here. Who is the Clerk?

A. I am, Sir.

Q. Will you read out the history, please.

The Clerk reads: Mrs. G. is sixty-eight years old, married. She has four children, all girls, alive and well. Her husband is alive and well. She has not been well for the last three months, following a chill, and she has been in bed since then. Her chief complaints are extreme lassitude, loss of weight, loss of muscular power, pain in the left subcostal region, abdominal pains about one hour after food, and constipation. The pain spreads from the lower part of the abdomen up the trunk to each side of the head. She said, "I feel as if my stomach is in my head." Bread or other solid food brings on the pain. She can take milk or tea without any subsequent pain. She feels cold in the stomach and the pain is better in warm weather, and also when she passes urine or belches. She is also short of breath and has to sleep propped up.

Q. How much weight has she lost?

A. During the last eighteen months she has lost 3 st. She weighs only 4 st. 8 lb. now.

Q. How tall is she?

A. I think about 5 ft.

Q. You have not measured her?

A. No, Sir.

Q. Her height is 4 ft. 11 in. What about the past history?

A. She has had no serious illnesses, and no operations. She had left-sided pneumonia in about 1938. Diabetes was detected first about four years ago.

Q. What is her nationality?

A. She was born in Poland, she has lived here for fifty years, but she speaks very little English.

Q. What about the family history?

A. Her father died aged seventy and her mother is dead. She does not know any details about them. One brother died of diabetes,

one is alive and well. One sister died of old age, one is alive and well.

Q. Now, Dr. J., you come from Liverpool, I believe, will you examine the patient and see if you can find out the cause of her troubles.

* * * * *

Q. Well, what do you find?

A. There is evidence of marked loss of weight.

Q. What evidence?

A. The skin over the abdomen is very lax and can easily be picked up. She is very wasted and the bony prominences are well marked. She looks dehydrated.

Q. I should have said she looks wizened rather than dehydrated, but I see from the notes my house physician agrees with you, and ordered 4 pints of fluid daily. What else did you find?

A. There is no obvious anæmia. There is senile osteo-arthritis of the wrists and fingers, with slight ulnar deviation. The tongue is dry. There are small petechial hæmorrhages on the soft palate. There are no abnormal signs in the chest. The apex beat is in the fifth left space, $2\frac{1}{2}$ in. from the mid-line. There are no murmurs. The blood pressure is 120/60 mm. Hg. The pulse is small and regular.

Q. What about the arteries?

A. I did not examine them.

Q. If you look at the arms you will see the brachial arteries are thickened, tortuous and move with each beat—they are locomotor. What about the abdomen?

A. It is slightly distended in the lower part. There is slight tenderness in the right loin and the lower pole of the right kidney is palpable. The liver edge is palpable on inspiration. There is no œdema of the legs. The central nervous system is normal. The power of the leg muscles is good.

Q. Have you tested the urine?

A. No, but I have seen the result of the urine test, there is no albumin and no sugar.

Q. When I examined the patient on February 11th, six days ago, the urine gave a thick green reduction with Benedict's solution, and 2 per cent of sugar was found in the urine on admission. Does that complete your examination?

A. Yes.

Q. You have not found very much wrong. What have you found? Loss of weight, senile osteo-arthritis of the hands, dry tongue, petechial hæmorrhages on the soft palate, slight tenderness in the right loin and liver just palpable. You said that there was slight ulnar deviation present, do you expect to find this with osteo-arthritis of the hands?

A. No. It is generally associated with rheumatoid arthritis.

Q. What is it due to?

A. Muscular spasm.

Q. I have heard certain eminent rheumatologists say so, but I think it is due to weakness of certain muscles and unbalanced action of their antagonists. In this case I do not think there is any ulnar deviation. What else might you have noticed in your examination? Something which may be of great diagnostic importance.

A. I do not know.

Q. Do not look at me, look at the patient.

Dr. J. looks at the patient's face, but not at her trunk or limbs, and says he can see nothing.

Q. Dr. H., what do you see?

Dr. H. examines the patient's chest, abdomen and legs.

A. Her skin generally looks rather brown, as if sunburnt, but the pigmentation is most marked on the parts not exposed to the sun, on the abdomen and thighs. There are a number of very dark brown spots, a little bigger than a pin's head on the dorsum of the feet and on the lower part of the legs. On the outside of the left foot there is one about 1 cm. in diameter. Over the sternum there is a small area of leucoderma.

Q. What would you say about her mentality, Dr. J.?

A. She is inclined to be irritable and resents answering questions, and she is unco-operative.

Q. Does she look ill?

A. Yes, chiefly on account of her loss of weight.

Q. What do you think is the matter with her?

A. I think she may have a neoplasm in the alimentary tract or genital organs.

Q. What other possibilities are there?

A. The whole condition may be due to diabetes, or she may have Addison's disease.

Q. What else?

A. She may have chronic renal disease and uræmia, or she may have fibroid phthisis.

Q. We had better take these one by one. I suppose that if you considered the cause of the ill-health might be a growth of the rectum or of the genital organs you made a pelvic examination?

A. No, I did not.

Q. Why not?

A. I did not think about it at the time and I should not have done it without asking your permission.

Q. Quite right. However, I expect my house physician has done so. Dr. E., what did you find?

A. On rectal examination there is slight tenderness high up on both sides, but I could feel nothing abnormal. On vaginal examination there is slight prolapse of the anterior vaginal wall; the mucous membrane shows some red spots on a pink background, ? senile vaginitis.

Q. There was, therefore, no sign of a pelvic tumour. The symptoms of loss of weight, and pain after solid food, suggest some gastric cause. What further investigations would you want?

A. A barium meal and enema, and tests for occult blood in the fæces.

Q. The *barium meal* report is, "Barium passed normally down the œsophagus in both erect and Trendelenberg positions, but in the latter position, with the stomach full, gastro-œsophageal regurgitation occurred. There was, however, no evidence of a hiatal hernia. No abnormality was detected in the stomach or duodenum." *Barium enema*: "No abnormality detected in the colon." The *occult blood tests* are negative. Are there any other tests you would like carried out to exclude a growth?

A. A fractional test meal, and a blood count and sedimentation rate of the red cells.

Q. The fractional test meal has not been done. The sedimentation rate of the red cells is normal, 5 mm./1 hour (Westergren). The blood count is Hb. 100 per cent, White cells 5,400 per c.mm., polymorphs. 67 per cent, lymphocytes 28 per cent, monocytes 5 per cent. The conclusion from these investigations is that the patient is not suffering from a growth in the alimentary tract or in the genital organs. Your next suggestions, Dr. J., were diabetes or Addison's disease. What do you want done about the diabetes?

A. A dextrose tolerance curve.

Q. What are the figures, Dr. E.?

A. Fasting blood sugar 100 mg./100 c.c. After 50 G. of dextrose by mouth the blood specimens were, $\frac{1}{2}$ hour 182 mg., 1 hour 200 mg., $1\frac{1}{2}$ hours 237 mg., and 2 hours 196 mg./100 c.c. There was no sugar in the fasting specimen of urine but 2 per cent sugar in the urine at $1\frac{1}{2}$ hours, and 3 per cent at 2 hours. It is a mild diabetic curve.

Q. She has therefore a mild diabetes, but it is easily controlled by diet alone, there is no acidosis and we can exclude it as the cause of her wasting and ill-health. Dr. K., what do you think about the suggestion of Addison's disease?

A. Not very much.

Q. What do you mean?

A. I do not think she has Addison's disease.

Q. Why not?

A. First of all the pigmentation does not suggest it. The pig-

mentation in Addison's disease is especially noticeable on the backs of the hands, in the axillæ, around the navel and the nipples, in the pubic region and where there is pressure, as around the waist or in the garter region—not that garters are often worn now.

Q. The small dark spots and the leucodermic patch on the other hand, are suggestive of Addison's disease. Where else may pigmentation be seen?

A. There may be slaty patches on the tongue, on the buccal mucous membrane or in the conjunctivæ, anus or vagina.

Q. We have not found any of these. What else is there against a diagnosis of Addison's disease?

A. The systolic blood pressure is usually below 100 mm. Hg., here it has been up to 120 mm.

Q. Are there any special tests you would like done for Addison's disease?

A. I should like to know the result of Thorn's test.

Q. What is that?

A. In normal people an intramuscular injection of mg. 25 A.C.T.H. stimulates the adrenal cortex to increase the output of 11-17-oxy-steroids, and this causes a fall of the circulating eosinophils in the blood of over 50 per cent. In adrenal cortical insufficiency the fall in eosinophils is less than 50 per cent.

Q. This test has been done. The first eosinophil count is made in the morning after a night's fast. The A.C.T.H. is then injected, breakfast is taken, and the second count is made 4 hours later. The figures were 36 eosinophils per c.mm. before the A.C.T.H., and 3 eosinophils per c.mm. 4 hours after the injection. This is a fall of $\frac{33}{36}$, which is 90 per cent. So the test is negative. What other test is there for Addison's disease?

A. There is usually, in Addison's disease, a fall in the sodium-potassium ratio of the blood below the normal of 30.

Q. What is the sodium-potassium ratio?

A. $\frac{\text{mEq. Na/L}}{\text{mEq. K/L}}$.

Q. This test has also been done. The figures are $\frac{130}{4} = 32.5$, so this test is also negative. I think we can say there is no evidence of Addison's disease here.

Now, Dr. J., your next suggestions were chronic renal disease and uræmia, or fibroid phthisis. The fact that no albumin has been found in the urine is rather against a diagnosis of chronic renal disease. What other tests do you want?

A. An examination of the urine for casts and the Van Slyke urea clearance test.

Q. The urine has been examined three times for casts and they have not been found. The Van Slyke urea clearance test is 72 per cent of normal, which is a normal reading and the blood urea is 32 mg./100 c.c. So there is no evidence of renal failure. An X-ray of the lungs shows no evidence of tuberculosis. All your suggestions, therefore, have proved negative, Dr. J. Dr. K., would you like to make a diagnosis?

A. The weakness, loss of weight and gastro-intestinal disturbances might be due to liver failure.

Q. This idea did apparently occur to my house physician, and he has had what is often called the "battery" of liver function tests carried out. Here they are: *Total serum protein* 6.6 G./100 c.c. *Albumin* 4.5 G., *globulin* 2.1 G./100 c.c. *van den Bergh*, direct reaction negative. *Bilirubin*, less than 0.4 mg./100 c.c. *Cholesterol*, 290 mg./100 c.c. *Cephalin cholesterol*, plus 2 units. *Bromsulphthalein excretion test*, at 5 minutes 44 per cent, at 45 minutes 1 per cent. All these tests are therefore negative. How is the bromsulphthalein test done?

A. Five mg./kg. body weight of dye are injected intravenously, and a specimen of blood is removed from a vein at 5 minutes and again at 45 minutes. Normally the 5-minute specimen contains between 15 and 85 per cent of the dye, and the 45-minute specimen between 0 and 5 per cent. A figure above 20 per cent in the second specimen indicates liver damage.

Q. Dr. W., you have not answered any questions this afternoon. What do you suggest we do now?

A. I have been wondering whether the pigmentation of the skin and the glycosuria may be due to hæmochromatosis.

Q. I think that is a very good suggestion. What do you mean by hæmochromatosis?

A. It is sometimes called diabète bronzé, and is thought to be due to an inborn error of iron metabolism.

Q. Who first described hæmochromatosis?

A. Osler.

Q. Oh, dear, no. Trousseau first described it in 1865. I have the account here in the New Sydenham Society publication of Trousseau's work, 1870, 3, 500. The patient was a man, twenty-eight years old, who had severe diabetes, an enlarged and very hard liver, which was neither hob-nailed nor painful. Trousseau said that he "was struck by the almost bronzed appearance of his countenance and the blackish colour of his penis." Hanot and Schachmann later called it diabète bronzé, and von Recklinghausen first called it hæmochromatosis. This is the name which has stuck, but it has also been called pigmentary

cirrhosis, visceral hæmosiderosis, and siderochromatosis. What is it characterized by?

A. Clinically by pigmentation of the skin and glycosuria, and pathologically by fibrosis of the liver and pancreas and deposition of hæmosiderin in excess in nearly all the tissues, including the skin.

Q. Is it more common in males or females?

A. In females, I think.

Q. No, that is quite wrong. Males predominate by over 20 to 1. The reason for this is probably that the losses of blood during menstruation and pregnancy get rid of excessive iron from the blood. The first case described in a woman was by Maude Abbott in 1901. The patient was aged fifty, and from the colour of the pigmentation was known as "blue Mary." She had no diabetes and died from ruptured œsophageal veins. If you want the reference it is *Journ. Path. and Bact.*, 1901, 7, 58. I had a male case in this hospital in 1938 which was published by my registrar, Dr. Pearson, in the *Middlesex Hospital Journal* in January 1939. His skin was a slaty grey-brown. He died from a hæmatemesis of over 5 pints, due to oozing from œsophageal varices.

What is said to be the explanation of hæmochromatosis?

A. There is probably an increased absorption of iron from the intestine. This may be due to a greater reducing power of the intestinal cells, which form more ferrous iron than normal.

Q. Apart from an inborn error of metabolism is there anything else which may cause hæmochromatosis?

A. I believe it has been described after transfusions.

Q. Yes, after many transfusions, such as may be given for aplastic anæmia. How could we decide whether this patient has hæmochromatosis?

A. The best test is a microscopical examination of the skin. In hæmochromatosis iron is found in the skin, especially in the epithelial cells of the sweat glands and around the sweat glands.

Q. A skin biopsy has been done, here is the report, "Section shows skin with basal pigmentation, but no indication of iron pigment," so that does not look very promising. Is there any other test for hæmochromatosis?

A. The blood iron content should be raised.

Q. What is the normal amount of iron in the serum? Does no one know? The figure usually given is 80 to 180 microgrammes per 100 c.c. In this case the serum iron content is normal, 100 microgrammes per 100 c.c. It looks, therefore, as if we can exclude hæmochromatosis. What would you suggest, Dr. W., may be the cause of the pigmentation.

A. It may be due to her race. You said she was born in Poland.

Q. Yes, I think we shall have to leave it at that for the present. We seem to have excluded all the likely causes. Do you think the shortness of breath and the fact that before admission to hospital she had to sleep propped up, could be due to her heart? Since resting in bed she has been able to sleep flat.

A. Dr. J. described the heart as normal, and he found no evidence of heart failure, but I should like to see an electrocardiogram.



FIG. 74. Calcified mass in spleen, ? tuberculous.

Q. I know you specialize in this, Dr. W., here it is. What does it show?

A. Bundle-branch block, left bundle-branch block.

Q. Tell us why you say that.

A. In the standard leads the QRS complex is wide and lasts longer than the normal 0.1 second. The R wave is notched. The T wave is in the opposite direction to the main initial deflection. The R wave is positive in Lead I. Usually in left bundle-branch block the main initial deflection is a negative S in Lead III, here it is an upright R wave. The V leads, however, show left bundle-branch block, widen-

ing of the QRS interval. In V.1 and V.2 R is small and S is deep and broad. In V.4, V.5 and V.6 there is a broad notched R wave.

Q. Which is more serious, right or left bundle-branch block?

A. Left bundle-branch block.

Q. What are the causes of left bundle-branch block?

A. It is usually associated with hypertensive heart disease, or with ischæmic heart disease, or with aortic valve disease.

Q. What are the causes of right bundle-branch block?

A. It is usually associated with mitral stenosis, atrial septal defects or massive pulmonary embolism.

Q. In this case there is evidence of arteriosclerosis; and there is probably cardiac ischæmia. It is possible that the shortness of breath here may be due to the heart block, but it would not account for all the symptoms. Now I would like you to look at this X-ray of the abdomen, Dr. W. What do you think of it?

A. There is a calcified shadow, looking rather like a leaf, in the left hypochondrium (see Fig. 74). There are several translucent areas in it.

Q. What do you think it is?

A. It might be a calcified suprarenal.

Q. That suggestion was made by the radiologist, but he found on screening that it moves with respiration. So what do you think now?

A. It is probably in the spleen.

Q. What do you think it is?

A. A calcified cyst in the spleen.

Q. Will you examine the abdomen and see if you can feel anything abnormal, which was not noted by Dr. J.

A. I can feel something in the left hypochondrium, which I should have thought was the left lobe of the liver, if I had not seen the X-ray.

Q. Yes, that is what we thought too, but we were wrong. We discussed the varieties of splenic cysts some time ago when we were considering a case of simple cyst in the spleen ("Applied Medicine," p. 291), so we will not go over them again now. If this is a calcified cyst what might it be?

A. A calcified hydatid.

Q. What else?

A. A calcified simple cyst.

Q. Looking at the X-ray film and seeing the semi-translucent areas in the calcified mass, what do you think is the most likely diagnosis?

A. Could it be a tuberculoma?

Q. Yes, I think it is a calcified tuberculoma containing caseous areas. If so the patient has suffered from tuberculosis in the past, but there is no evidence to show where the primary focus was situated.

The infection was presumably carried to the spleen along the splenic artery. There is one other point. Pigmentation of the skin is said to be associated with chronic abdominal tuberculosis, so that is a possible cause in this case. The normal temperature and normal sedimentation rate of the red cells are opposed to a diagnosis of active tuberculosis. Do you think this tuberculoma is giving rise to any symptoms?

A. It may account for the pain the patient complains of in the left lower costal region.

Q. If you look at the film carefully you will see another calcified shadow, which the radiologist considers to be a calcified splenic artery. This confirms the view that the patient has diffuse arteriosclerosis, and would support a diagnosis of cardiac ischæmia.

This patient was admitted for investigation because it was feared that she was suffering from some serious disease which was causing the wasting, loss of appetite, pain and ill health. The investigations have not shown any evidence of malignant disease and we hope that with rest in bed and an adequate dietary, she will soon improve. The diabetes is easy to control, but there is probably serious cardiac damage which renders the ultimate prognosis unfavourable.

And that, I think, will be enough for this afternoon. As John Fletcher wrote in the preface to "The Faithful Shepherdess," "to teach you more for nothing, I do not know that I am in conscience bound."

* * * * *

The patient left hospital five weeks later feeling much stronger, eating comparatively well, with no symptoms of indigestion and having gained 11 lb. in weight. The blood pressure rose to 140/80 mm. Hg.

The treatment consisted in a carefully regulated diet and the administration of a nux vomica and gentian mixture.

IDLE THOUGHTS

IN rheumatoid arthritis the fingers and hands are stiff on waking in the morning, and the stiffness is relieved by soaking them in hot water. In the arthritis sometimes met with in myxoedema, which may be mistaken for rheumatoid arthritis, there is no early morning stiffness, the patient complaining of swelling, numbness and tingling.

* * * * *

Transverse deep ridges may form in the nails of one hand, associated with slow growth of the nails, following a venous thrombosis in the arm.

* * * * *

A patient with kyphosis likes a chair with arms.

* * * * *

We do not see aneurysms nowadays. We see uncoiled aortas.

* * * * *

It is better for a diabetic patient who is having insulin to pass sugar in the urine in the morning than to pass into hypoglycæmia while asleep at night.

* * * * *

Why is it that when a doctor asks a patient to open his eyes and shut his mouth he always does the reverse?

* * * * *

Enlarged cervical glands may be the presenting symptom in herpes affecting the scalp.

* * * * *

Physicians prefer to consult surgeons who are predictable.

* * * * *

It is strange that the subjects of consultations which so often break the good relationship between a physician and a general practitioner begin with the letter A : Abortion, Adultery, Adoption, Alcohol.

* * * * *

A patient with heart failure has to be very well to take a rice diet.

* * * * *

A patient will complain that he is not a 100 per cent better, although admitting he has only carried out 90 per cent of the treatment recommended by his doctor.

* * * * *

With left-sided heart failure there is often a rapid loss of weight of 10 or 12 lb.; in right-sided failure there is frequently a gain of weight due to water retention.

* * * * *

Γνωθι σεαυτόν was inscribed in gold letters over the portico of the temple at Delphi. In many cases now it would be better to advise our patients to ignore rather than to know themselves.

* * * * *

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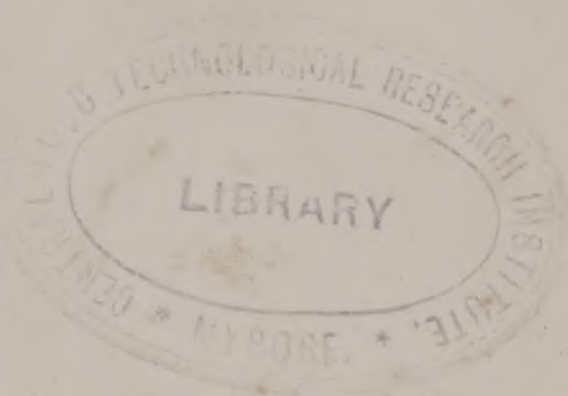
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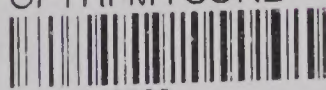
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